299

PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

# CONTENTS


| TRADE NAME | MODEL | SET AND FOLDER No. |
|---|---|---|
| Airline | WG-5102A, WG-5103A Tel. Rec. | 299-2 |
| Benrus | 10B01B15B (Ch. 10B) | 299-3 |
| Emerson | 1102D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D, 1143D (Ch. 120245-D, -N, 120255-D, -F, -H, 120256-D, -F, -H, -N, 120259-D, -F, -H, -N, 120269-L, 120273-F, 120275-L, 120276-L & Radio. Ch. 120272-B) Tel. Rec. | 299-4 |
| Motorola | 55A1, 55A2, 55A3 (Ch. HS-422) | 299-5 |
| Packard | 472047, 472048 | 299-6 |
| Philco | Ch. TV-300, TV-301, A, W Tel. Rec. Prod. Chg. Bul. 139 | 299-1 |
| RCA Victor | 6-BX-5, 6-BX-6A, B, C (Ch. RC-1149) | 299-7 |
| Sentinel | 1U-1001B, 1U-1011B, 1U-1017B, 1U-1034B Tel. Rec. | 299-8 |
| Sparton | 16A211 (Ch. CTV-2) Tel. Rec. | 299-9 |
| Webster Electric | 96-10 | 299-10 |
| Westinghouse | H-499T5A, H-500T5A (Ch. V-2238-1) | 299-11 |

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 7 IN SET 276

CORRECTION NOTICE

The Halldorson replacement for T3, Horizontal Output Transformer, should be FB414 *.

Philco chassis TV-300 and TV-301 were covered in Photofact Folder 7 — Set 276 .

Chassis TV-301A, TV-301W and TV-304 are added with the publication of this bulletin.

Following is a list of all models and chassis used in each.

| MODEL | CHASSIS | MODEL | CHASSIS |
|---|---|---|---|
| 18C3010, E, L, M | TV-300, TV-301A, TV-301W | 22C4121, L | TV-300, TV-301, TV-301A |
| 22C4006 | TV-301, TV-301A | 22C4123 | TV-300, TV-301 |
| 22C4011, X, XL, XW | TV-300, TV-301, TV-301A | 22C4124, L, S | TV-300, TV-301 |
| 22C4013, L, X | TV-300, TV-301 | 22C4125, HM | TV-300, TV-301 |
| 22C4015 | TV-300, TV-301 | 22C4127 | TV-301, TV-301A |
| 22C4018 | TV-300, TV-301 | 22C4130 | TV-301, TV-301A |
| 22C4113, L | TV-301, TV-301A | 22C4310, L | TV-300, TV-301, TV-301A |
| 22C4117 | TV-301A | 22C4311 | TV-301 |
| 22C4118 | TV-301, TV-301A | 24C4006 | TV-301 |
| 22C4119 | TV-300, TV-301 | | |
| 22C4120, L, X | TV-300, TV-301 | | |

Following is a list of production changes covering chassis TV-300 and TV-301. Later a comparison of chassis TV-301A and TV-301W will be made.

Run 2

TO IMPROVE VERTICAL CENTERING

R70 is increased from 470KΩ to 680KΩ.

Run 3

TO IMPROVE OVERLOAD LEVEL

C45 is increased from .15MFD to .22MFD.

R47 is decreased from 560KΩ to 470KΩ.

R45 is decreased from 1.5Meg to 1Meg.

Run 4

TO IMPROVE FOCUS

To improve focus under variable conditions the electrostatic focus anode (pin 6 of V7) is connected directly to the 260V source.

Run 5

TO FACILITATE PRODUCTION

T3, horizontal output transformer, changed to part #32-8677-1.

R94 is decreased from 3.3Ω to 2.2Ω.

PHILCO CHASSIS TV-300, TV-301, TV-301A, TV-301W

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PRODUCTION CHANGES
BULLETIN 139

PRODUCTION CHANGES
BULLETIN 139



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| | |
|---|---|
| Runs 7 & 8 | TO INCREASE VIDEO OUTPUT<br>R42 is decreased from 18KΩ to 10KΩ.<br>R46 is decreased from 10Meg to 6.8Meg.<br>R45 is increased from 1Meg to 1.5Meg, 5%.<br>R43 may be 5.6KΩ in early models. |
| | COMPONENT CHANGE<br>R91 and R92 are replaced by a single 10KΩ, 10 watt resistor.<br>L29 is decreased from 400MH to 250MH.<br>C39 is decreased from 3000MMF to 2000MMF.<br>R43 is increased from 1 watt to 2 watts. |
| Ch. TV-301A | Chassis TV-301A is electrically identical to chassis TV-300, except for the following changes:<br>A .1MFD, 600V capacitor added from the junction of R32, C31 and L21 to ground.<br>R41 is decreased from 100Ω to 82Ω.<br>A 1Meg resistor is connected from pin 2 to pin 1 of V6 (12BY7).<br>R42 is decreased from 18KΩ to 6.8KΩ.<br>R44 is increased from 8.2Meg to 10Meg.<br>A 1200Ω, 1 watt resistor added from L29 to R43.<br>R43 is decreased from 6.8KΩ, 1 watt to 5.6KΩ, 2 watt.<br>R52, shunting L30, is increased from 6.8KΩ to 10KΩ.<br>R67 is decreased from 15KΩ to 8.2KΩ.<br>R68 is increased from 8.2KΩ to 15KΩ.<br>V10, sync separator and horizontal AFC, is changed to a 12BR7.<br>R78 is increased from 180KΩ to 390KΩ.<br>C47B and R57 are omitted and pin 7 of V7 is grounded.<br>A 100KΩ resistor added from pin 1 of V7 to ground.<br>A 47.25MC trap is added. A partial schematic showing the new circuit is given in Fig. 1.<br>A new horizontal oscillator circuit is employed. A partial schematic showing the new circuit is given in Fig. 2.<br>In later production of chassis TV-301A the following changes were made. |
| Run 2V | TO IMPROVE VERTICAL LINEARITY<br>R72 is increased from 10KΩ to 12KΩ. |
| Runs 3 & 4 | TO IMPROVE PICTURE QUALITY<br>The video output and sound take-off have been revised. A partial schematic showing the new circuit is given in Fig. 3.<br>V6, video output, changed to a 12BV7. |
| | COMPONENT CHANGE<br>The .1MFD, 600V capacitor added from the junction of R32, C31 and L21 to ground is omitted in Runs 3 & 4.<br>R36 is decreased from 1KΩ to 470Ω.<br>R35 is increased from 180Ω to 220Ω.<br>R56 is increased from 120Ω to 270Ω.<br>R55 is decreased from 4000MMF to 2000MMF.<br>A partial schematic is given in Fig. 4 showing the new sound IF. |
| Ch. TV-301W | Chassis TV-301W is electrically identical to chassis TV-301A, Runs 3 & 4 except, for the following changes.<br>C48A is increased from 390MMF to 1500MMF.<br>R72 is removed from ground and reconnected to pin 3 of V11. |
| | PRINTED CIRCUIT<br>The video IF strip has been changed to the printed circuit type. A partial schematic showing the new circuit is given in Fig. 5. |

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| | |
|---|---|
| Ch. TV-301W<br>Run 2 | NEW TUNER<br>The tuner was changed to part #76-8946-5. Electrically these tuners are identical. The only difference is in the UHF dial cord arrangement. A drawing showing this new arrangement is given in Fig. 6. |
| Run 3 | TO REDUCE HORIZONTAL OSCILLATOR DRIFT<br>R85 is increased from 1 watt to 2 watts. |

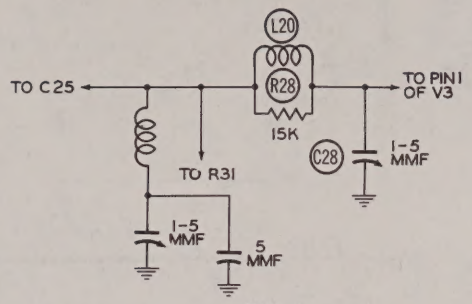



FIG. 1

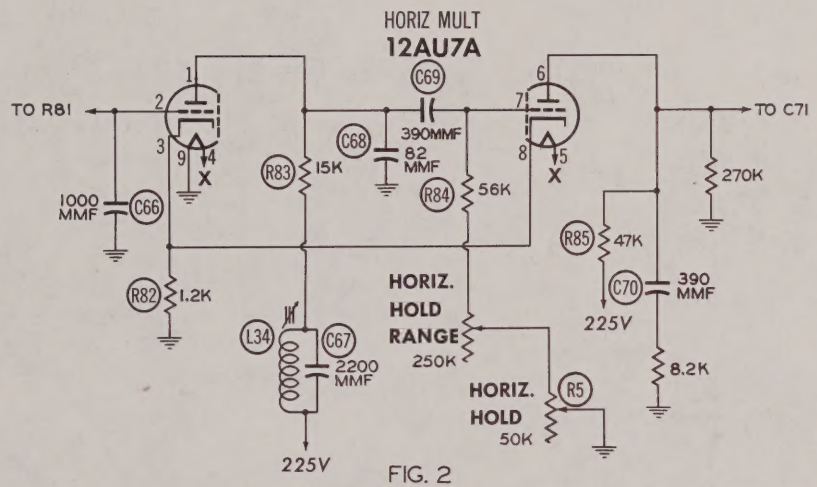



FIG. 2

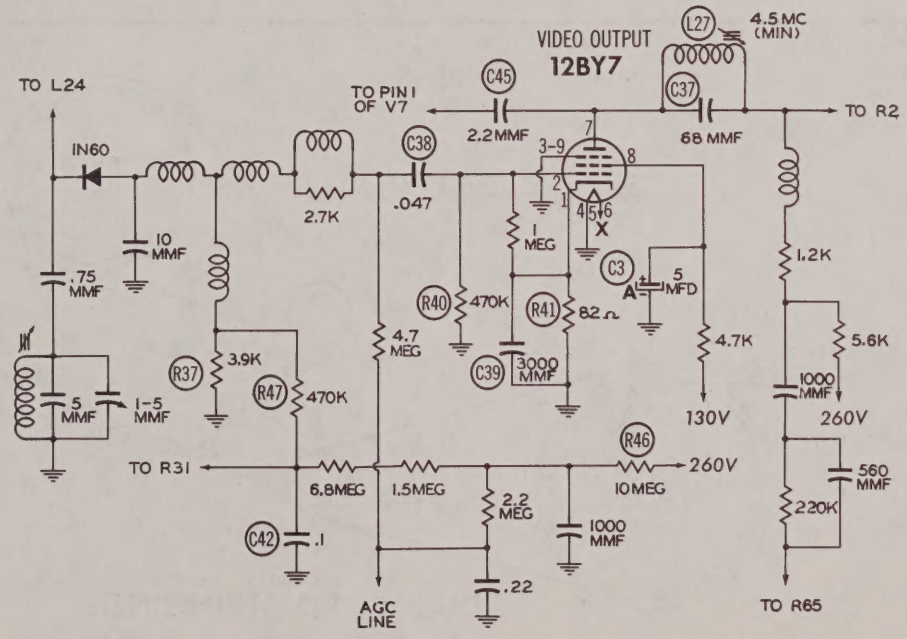



FIG. 3

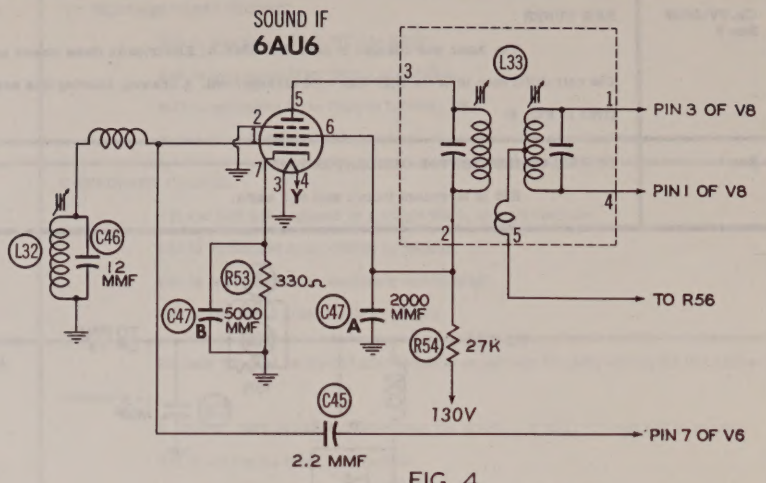



FIG. 4

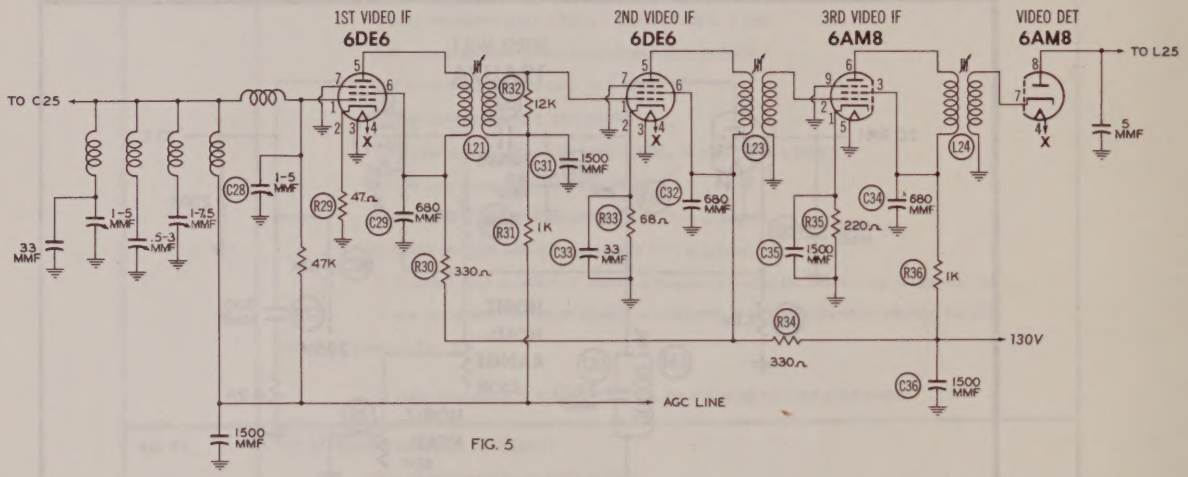
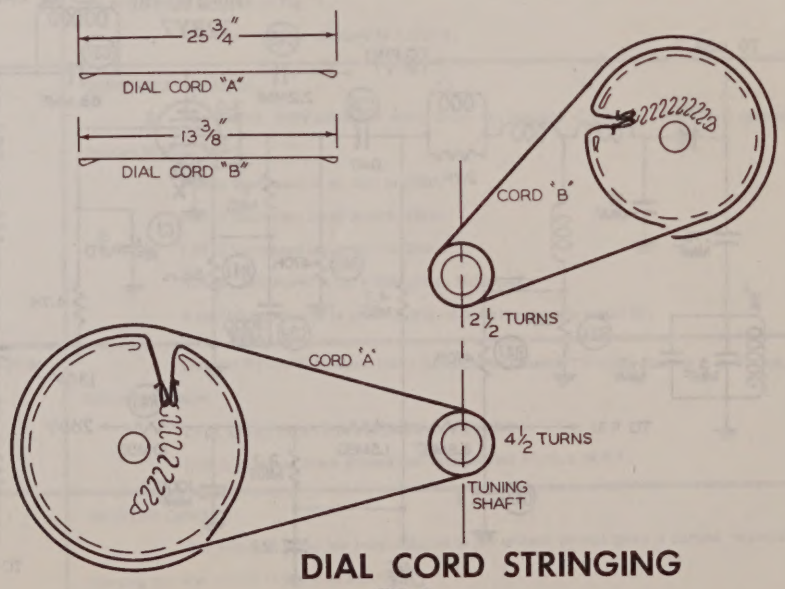



FIG. 5




**DIAL CORD STRINGING**

FIG. 6

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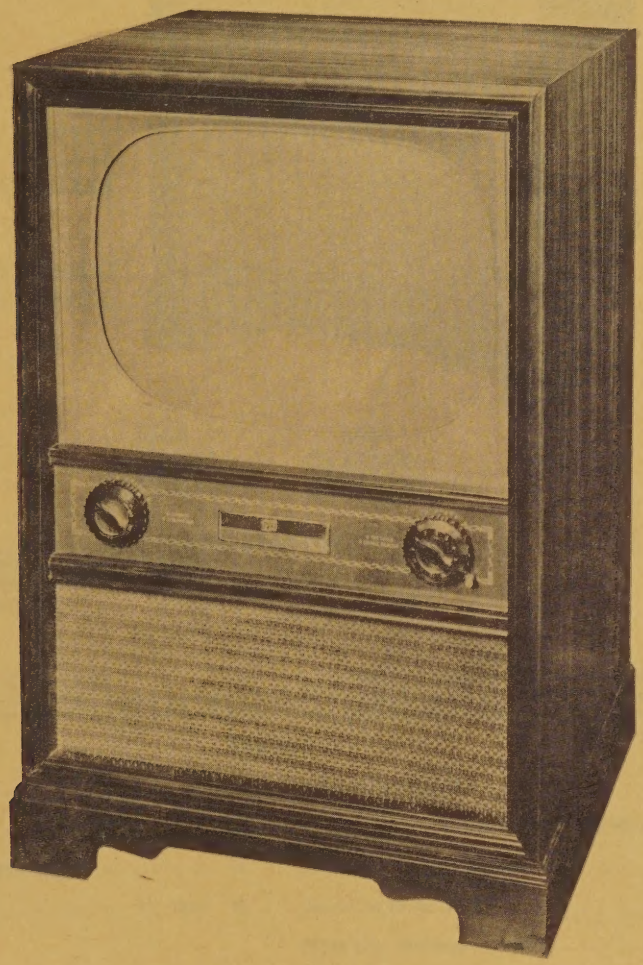

MODEL WG-5102A

AIRLINE MODELS
WG-5102A, WG-5103A

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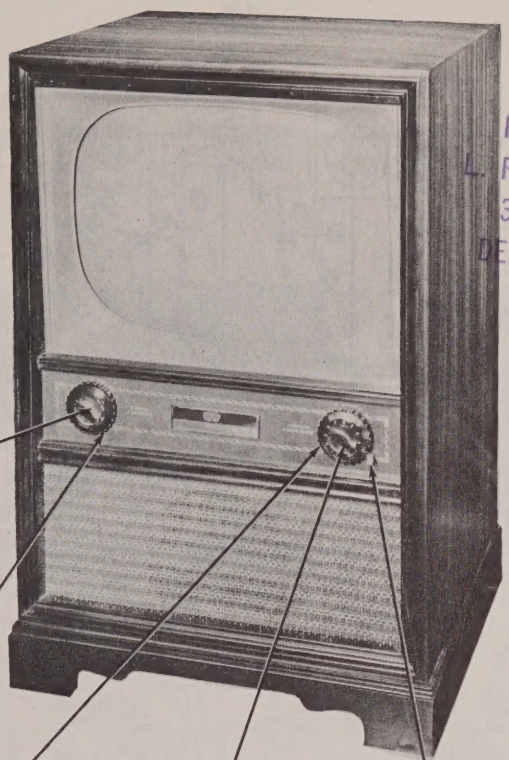


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AIRLINE MODELS
WG-5102A, WG-5103A

AIRLINE MODEL WG-5102A

| | |
|---|---|
| TRADE NAME | Airline Models WG-5102A, WG-5103A |
| SUPPLIER | Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois |
| TYPE SET | Television Receiver |
| TUBES | Twenty-Four |
| POWER SUPPLY | 110-120 Volts AC-60 Cycle RATING 1.74 Amp. @ 117 Volts AC |
| TUNING RANGE | Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) |

## INDEX

Alignment Instructions ..... 6, 7
Disassembly Instructions ..... 23
Horizontal Sweep Circuit Adjustments ..... 11
Parts List and Descriptions ..... 15 thru 19
Photographs
Cabinet-Rear View ..... 11
Capacitor Identification ..... 4, 9
Chassis-Top View ..... 3
RF Tuner ..... 21
Resistor Identification ..... 13, 20
Photographs (Cont)
Trans., Inductor & Alignment Identification ..... 14
Resistance Measurements ..... 8
Servicing in the Field ..... 22
Schematic (Alternate Tuner) ..... 10
Schematic (TV) ..... 2
Trouble Shooting Aids ..... 12, 21
Tube Failure Check Chart ..... 5
Tube Placement Chart (Bottom View) ..... 8
Tube Placement Chart (Top View) ..... 5

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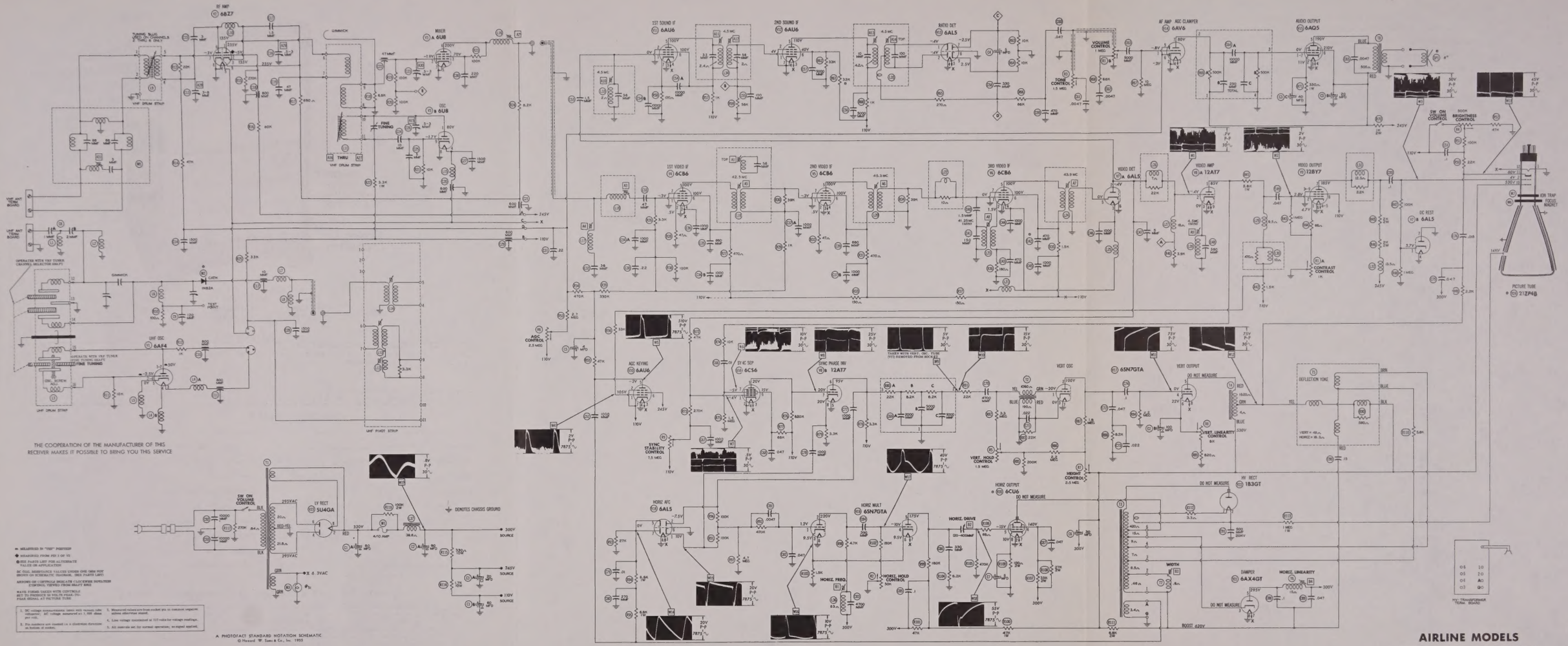
AIRLINE MODELS
WG-5102A, WG-5103A
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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AIRLINE MODELS
WG-5102A, WG-5103A

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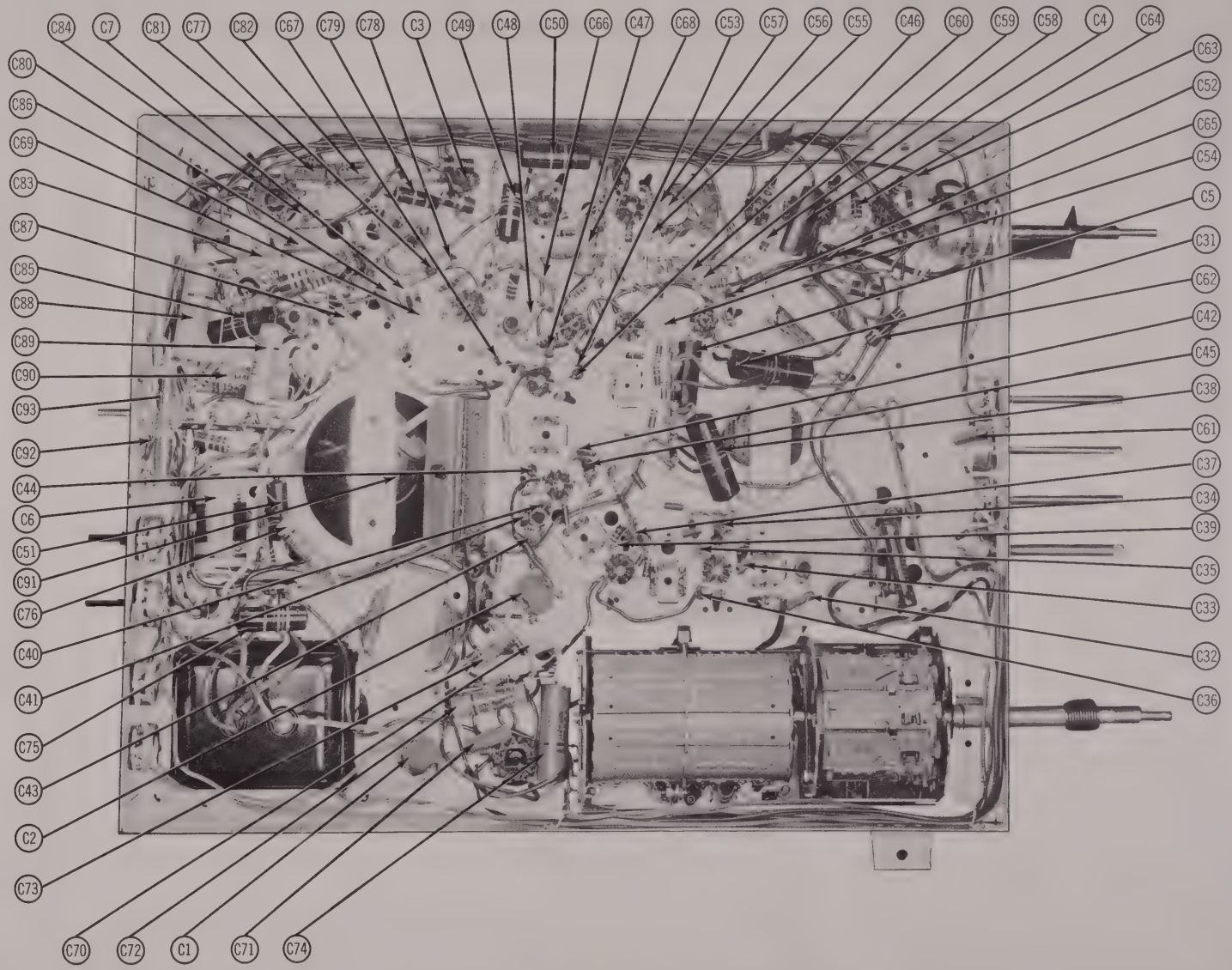
CHASSIS-TOP VIEW

AIRLINE MODELS
WG-5102A, WG-5103A




CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION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# TUBE PLACEMENT CHART

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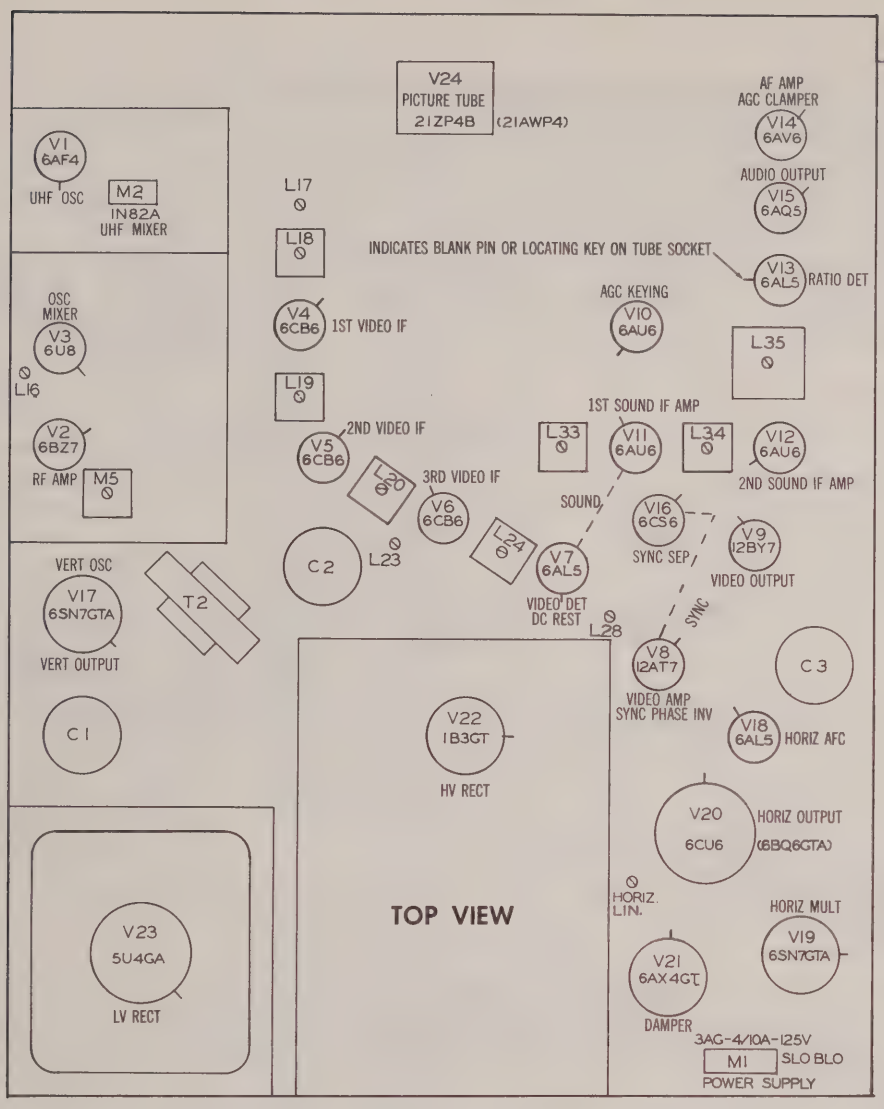


# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V23, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V8, V9, V10, V24**
Has pic, no sound - **V11, V12, V13, V14, V15**
Overloaded picture - **V10, V14**

SYNC FAILURE
No vert. sync - **V8, V17**
No horiz. sync - **V8, V18, V19**
No vert. or horiz. sync - **V8, V16**

SWEEP FAILURE
No raster, has sound - **V19, V20, V21, V22, V24**
No vertical deflection - **V17**
Poor vert. linearity or foldover - **V17**
Poor horiz. linearity or foldover - **V19, V20, V21**
Narrow picture - **V19, V20, V21, V22, V23**
Vert. off freq. - **V8, V17**
Horiz. off freq. - **V8, V18, V19**

# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

The high voltage lead should be securely taped and kept away from chassis. Do not remove the horizontal multivibrator tube (V19) to disable the high voltage.

## VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the ungrounded side of C34A. Connect the positive lead to chassis. Remove the RF Amplifier Tube (V2) from its socket.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| ① | Direct | High side to an ungrounded tube shield floating over dummy converter tube (V3). Low side to chassis. | 44MC (10MC Swp. | 41.25MC 45.75MC 47.25MC | Any unused channel | Vert. Amp. thru detector(Fig. 1) to pin 5 (plate) of 6CB6 (V4). Low side to chassis. | A1, A2, A3, A4 | Adjust A1 to place 47.25MC marker in trap notch as in Fig. 2. Adjust A2, A3 and A4 for response similar to Fig. 2. A2 and A3 affects flat portion of curve. A4 positions 41.25MC marker. Make sure 45.75MC marker is on peak as shown or the 44.5MC marker on overall response curve (Fig. 3) will be incorrect. |
| ② | " | " | Not used. | 42.5MC (Unmod. ) | " | Use VTVM DC probe to point Ⓐ. Common to chassis. | A5 | Increase bias from 1.5 volts to 4.5 volts at ungrounded side at C34A. Attenuate generator output to maintain 1 volt at VTVM. Adjust for maximum deflection. |
| ③ | " | " | " | 45.3MC | " | " | A6 | " |
| ④ | " | " | " | 43.9MC | " | " | A7 | " |
| ⑤ | " | " | " | 41.25MC | " | " | A8 | Adjust for MINIMUM deflection. |
| ⑥ | " | " | 44MC (10MC Swp.) | 41.25MC 42.25MC 42.5MC 43.9MC 44.5MC 45.3MC 45.75MC 47.25MC | " | Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis. | | Check for response similar to Fig. 3. SLIGHTLY retouch A5 thru A8 to obtain desired response. If A1 thru A4 requires retouching, step 1 should be repeated. To observe 41.25 and 47.25MC trap markers increase sweep generator output. A7 affects flat portion of curve. A8 affects high frequency side and A5 affects the low frequency side of the response curve. |

## 4.5MC TRAP ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| ⑦ | 10KΩ resistor | High side thru a 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis. | 4.5MC (Unmod. ) | Any noninterfering channel | DC probe thru detector (Fig. 4) to pin 2 (grid) of picture tube. Common to chassis. | A9 | Set contrast control fully clockwise. Adjust for minimum deflection. |

## ALTERNATE 4.5MC TRAP ALIGNMENT

Replace the RF amplifier tube (V2) and remove bias. Tune in a TV station and adjust A9 for minimum 4.5MC beat interference in picture.

## SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

If a signal generator providing 4.5MC signal of crystal is not available restore the set to normal operating condition and tune in a local TV station. Connect the VTVM and adjust A10 thru A14 as in steps 8, 9 and 10.
Remove 6CB6 (V6) from its socket.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| ⑧ | 10KΩ Resistor | High side thru 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis. | 4.5MC (Unmod. ) | Any | DC probe to point Ⓑ. Common to chassis. | A10, A11 A12 | Adjust for maximum deflection. |
| ⑨ | " | " | " | " | DC probe to point Ⓒ. Common to chassis. | A13 | Use only enough signal generator output to pprovide useable indication at VTVM. Adjust for maximum deflection |
| ⑩ | " | " | " | " | DC probe to point Ⓓ. Common to chassis. | A14 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V6 in its socket. |

## SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6CB6 (V6) from its socket.
Use frequency modulated signal with 80% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| ⑧ | 10KΩ resistor | High side thru 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis. | 4.5MC (450KC Swp | 4.5MC | Any | Vert. Amp. to point Ⓑ. Low side to chassis. | A10, A11 A12 | Adjust for curve of maximum amplitude and symmetry similar to Fig. 5. |
| ⑨ | " | " | " | " | " | Vert. Amp. to point Ⓒ. Low side to chassis. | A13 | Disconnect stabilizing capacitor C4. Use only enough sweep generator output to provide useable indication on scope. Adjust for curve of maximum amplitude and symmetry similar to Fig. 5. |
| ⑩ | " | " | " | " | " | Vert. Amp. to point Ⓓ. Low side to chassis. | A14 | Reconnect stabilizing capacitor C4. Adjust so that 4.5MC occurs at center of crossover frequency as in Fig. 6. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines. Replace V6 in its socket. |

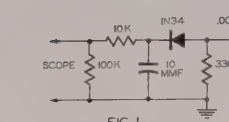

FIG. 1

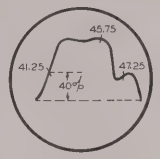

FIG. 2

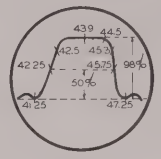

FIG. 3

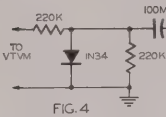

FIG. 4

FIG. 5

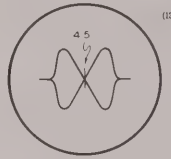

FIG. 6

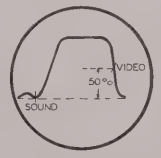

FIG. 7

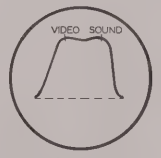

FIG. 8

## VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt battery to the ungrounded side of C34A. Connect the positive lead to chassis.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A15. It should be noted that this is an all channel oscillator adjustment and should not be used to correct any individual channel. If adjustment of A15 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment screw for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just to the left of the channel switch shaft (hole extends through UHF tuner).
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| (11) | Two 120Ω Carbon Resistors | Across VHF Antenna terminals with 120Ω in each lead. | 213MC (10MC Swp. | 211.25MC 215.75MC | 13 | Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis. | A16 | Adjust to place marker in trap notch as in Fig. 7. Video marker should be at 50%. |
| | | | 207MC (10MC Swp. | 205.25MC 209.75MC | 12 | | A17 | |
| | | | 201MC (10MC Swp. | 199.25MC 203.75MC | 11 | | A18 | |
| | | | 193MC (10MC Swp. | 193.25MC 197.75MC | 10 | | A19 | |
| | | | 189MC (10MC Swp. | 187.25MC 191.75MC | 9 | | A20 | |
| | | | 183MC (10MC Swp. | 181.25MC 185.75MC | 8 | | A21 | |
| | | | 177MC (10MC Swp. | 175.25MC 179.75MC | 7 | | A22 | |
| | | | 85MC (10MC Swp. | 83.25MC 87.75MC | 6 | | A23 | |
| | | | 79MC (10MC Swp. | 77.25MC 81.75MC | 5 | | A24 | |
| | | | 69MC (10MC Swp. | 67.25MC 71.75MC | 4 | | A25 | |
| | | | 63MC (10MC Swp. | 61.25MC 65.75MC | 3 | | A26 | |
| | | | 57MC (10MC Swp. | 55.25MC 59.75MC | 2 | | A27 | |

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## VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C31. Connect the positive lead to chassis.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| (12) | Two 120Ω Carbon Resistors | Across VHF Antenna terminals with 120Ω in each lead. | 207MC (10MC Swp.) | 205.25MC 209.75MC | 12 | Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis. | A28, A29 A30 | Adjust for response similar to Fig. 8, with markers above 90%. |
| (13) | " | " | 213MC (10MC Swp. | 211.25MC 215.75MC | 13 | " | | If markers fall below 70% on any channel, make compromise adjustments of A28, A29 and A30 with channel switch set to that channel. Then check all other channels to see that they have not been seriously affected. |
| | | | 201MC (10MC Swp.) | 199.25MC 203.75MC | 11 | | | |
| | | | 193MC (10MC Swp.) | 193.25MC 197.75MC | 10 | | | |
| | | | 189MC (10MC Swp.) | 187.25MC 191.75MC | 9 | | | |
| | | | 183MC (10MC Swp.) | 181.25MC 185.75MC | 8 | | | |
| | | | 177MC (10MC Swp.) | 175.25MC 179.75MC | 7 | | | |
| | | | 85MC (10MC Swp.) | 83.25MC 87.75MC | 6 | | | |
| | | | 79MC (10MC Swp.) | 77.25MC 81.75MC | 5 | | | |
| | | | 69MC (10MC Swp.) | 67.25MC 71.75MC | 4 | | | |
| | | | 63MC (10MC Swp.) | 61.25MC 65.75MC | 3 | | | |
| | | | 57MC (10MC Swp.) | 55.25MC 59.75MC | 2 | | | |

## IF WAVE TRAP ADJUSTMENT

The IF wave trap should be tuned to minimize interference caused by signals which fall within the video IF band-pass (40-48MC). Tune in a station on which the interference is noted and adjust A31 for minimum interference in the picture.

## UHF OSCILLATOR ADJUSTMENT

The UHF oscillator channel strip adjustment screws are reached through the same hole provided for VHF channel oscillator adjustment screws. Tune in all UHF stations available and check each one to see if the fine tuning control can be tuned through a point where clearest picture and best sound occur. If the fine tuning control does not have sufficient range on any UHF channel strip set the fine tuning control to its mid-range position and then adjust the UHF channel strip oscillator screw for clearest picture and best sound.

## UHF RF ALIGNMENT

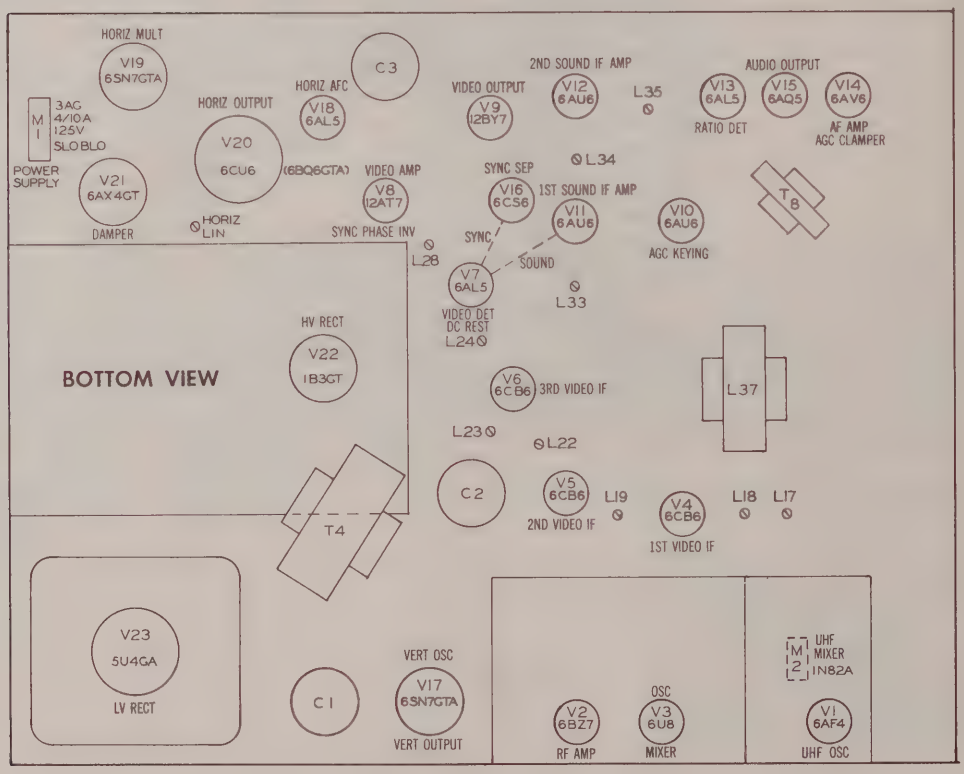
The UHF RF portion of this receiver has been properly aligned at the factory and is very stable.
Alignment of this portion is not recommended in the field.

AIRLINE MODELS
WG-5102A, WG-5103A

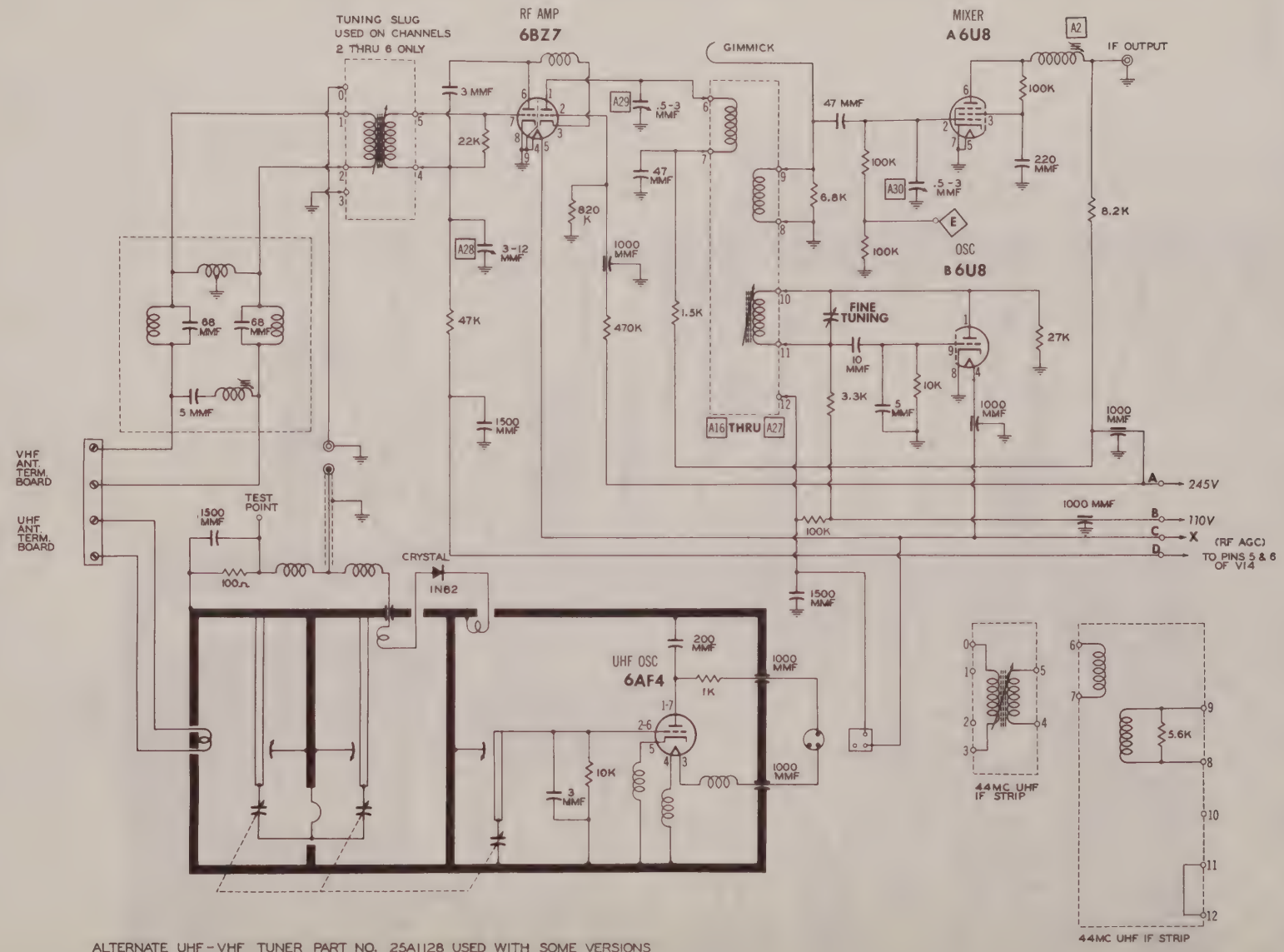
# RESISTANCE MEASUREMENTS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6AF4 | *†6.3KΩ | 10KΩ | .1Ω | 0Ω | 0Ω | 10KΩ | *†6.3KΩ | | |
| V 2 | 6BZ7 | †1.1KΩ | 130KΩ | Inf. | 0Ω | .1Ω | Inf. | 950KΩ | 0Ω | †1.1KΩ |
| V 3 | 6U8 | †5.3KΩ | 200KΩ | †110KΩ | .1Ω | 0Ω | †8.5KΩ | 0Ω | 0Ω | 10KΩ |
| V 4 | 6CB6 | 100KΩ | 47Ω | 0Ω | .1Ω | †2.8KΩ | †2.8KΩ | 0Ω | | |
| V 5 | 6CB6 | 100KΩ | 47Ω | 0Ω | .1Ω | †2.7KΩ | †2.7KΩ | 0Ω | | |
| V 6 | 6CB6 | .2Ω | 180Ω | 0Ω | .1Ω | †3.5KΩ | †3.5KΩ | 0Ω | | |
| V 7 | 6AL5 | 1Meg | 3.9KΩ | .1Ω | 0Ω | .5Ω | 0Ω | 0Ω | | |
| V 8 | 12AT7 | †9KΩ | 3.9KΩ | .3Ω | 0Ω | 0Ω | †5.3KΩ | †820KΩ | 3.3KΩ | .1Ω |
| V 9 | 12BY7 | 250Ω | 1Meg | 0Ω | .1Ω | .1Ω | 0Ω | †4.3KΩ | †2.1KΩ | 0Ω |
| V 10 | 6AU6 | †35KΩ | †2.1KΩ | .1Ω | 0Ω | 500KΩ | †400Ω | †2.1KΩ | | |
| V 11 | 6AU6 | 2Ω | 0Ω | 0Ω | .1Ω | †3KΩ | †3KΩ | 100Ω | | |
| V 12 | 6AU6 | 56KΩ | 0Ω | .1Ω | 0Ω | †3KΩ | †.8KΩ | 0Ω | | |
| V 13 | 6AL5 | Inf. | Inf. | .1Ω | 0Ω | 10KΩ | 0Ω | 10KΩ | | |
| V 14 | 6AV6 | 10Meg | 0Ω | .1Ω | 0Ω | 900KΩ | 900KΩ | †500KΩ | | |
| V 15 | 6AQ5 | 500KΩ | 330Ω | 0Ω | .1Ω | †1.9KΩ | †1.4KΩ | 500KΩ | | |
| V 16 | 6CS6 | 50KΩ | 0Ω | .1Ω | 0Ω | †820KΩ | †70KΩ | 1.5Meg | | |
| V 17 | 6SN7GTA | 4.5Meg | ▲2.5Meg | 190Ω | 2.2Meg | ▲8.5KΩ | 2.5KΩ | 0Ω | .1Ω | |
| V 18 | 6AL5 | 4.8Meg | 4.8Meg | .1Ω | 0Ω | 10KΩ | NC | 10KΩ | | |
| V 19 | 6SN7GTA | 5Meg | †4.8KΩ | 1.5KΩ | 200KΩ | †230KΩ | 1.5KΩ | .1Ω | 0Ω | |
| V 20 | 6CU6 | TP | 0Ω | TP | †16KΩ | 470KΩ | TP | .1Ω | 100Ω | TOP CAP ▲15Ω |
| V 21 | 6AX4GT | TP | NC | 1.5Meg | TP | †60Ω | NC | .1Ω | 0Ω | |
| V 22 | 1B3GT | | PINS | 1-8 | HAVE | INF | RESISTANCE | | | TOP CAP ▲435Ω |
| V 23 | 5U4GA | Inf. | 45KΩ | Inf. | 20Ω | Inf. | 22Ω | Inf. | 45KΩ | |
| V 24 | 21ZP4B | 0Ω | 1.1Meg | PIN 10 ▲6.8KΩ | PIN 11 †240KΩ | PIN 12 .1Ω | | | | |

*MEASURED IN "UHF" POSITION.
†MEASURED FROM PIN 2 OF V23.
▲MEASURED FROM PIN 3 OF V21.
TP-TIE POINT.
NC-NO CONNECTION.
ALL MEASUREMENTS TAKEN IN "VHF" POSITION UNLESS OTHERWISE DESIGNATED.




# TUBE PLACEMENT CHART




ALTERNATE UHF-VHF TUNER PART NO. 25A1128 USED WITH SOME VERSIONS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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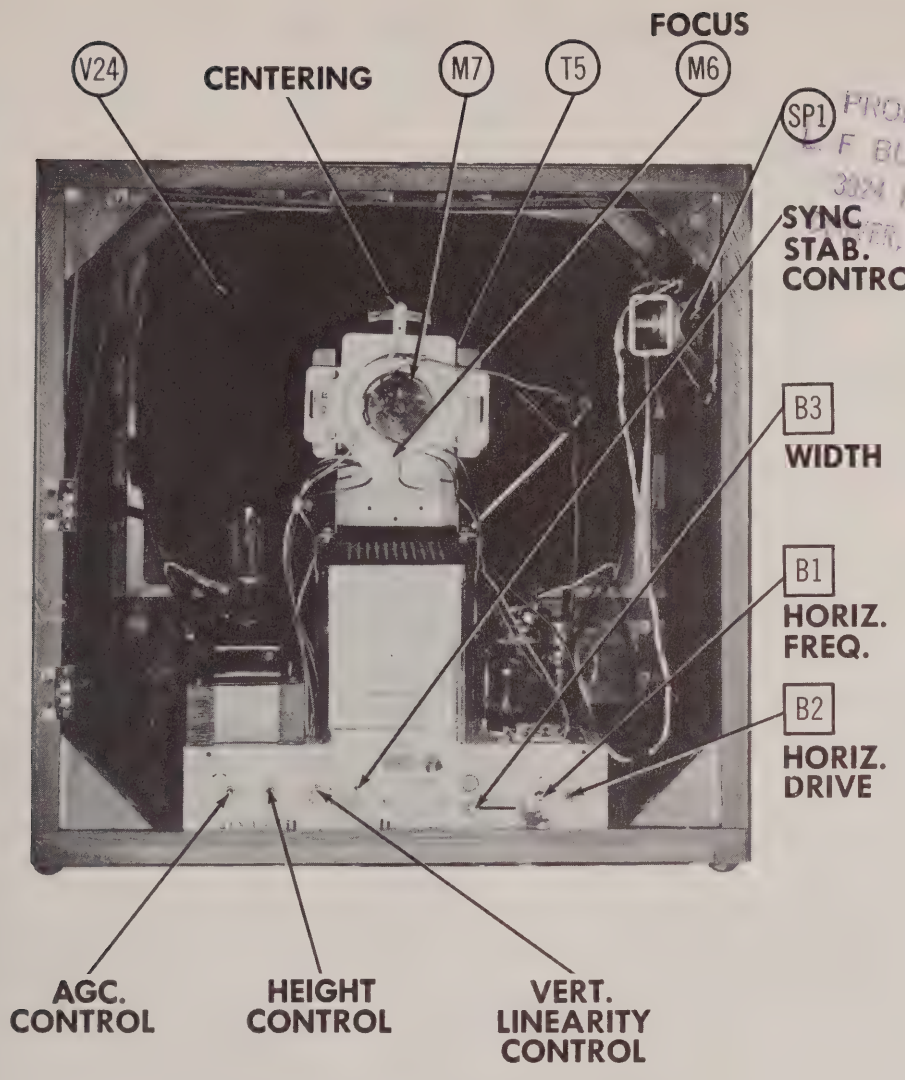
# ALTERNATE TUNER SCHEMATIC

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CABINET—REAR VIEW



## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until picture synchronizes horizontally. Switch off channel and back again. The picture should pull into sync and remain in sync thru 90 degree rotation of horizontal hold control.

Turn the contrast control maximum counter clockwise and adjust the brightness control for a washed out picture.

Adjust the horizontal drive trimmer (B2) clockwise as far as possible without the presence of a vertical white line near the center of the raster.

Adjust the width coil (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity coil (B4) for a picture that is symmetrical from left to right.

Recheck setting of B2, then repeat horizontal oscillator adjustment (B1) as above.

# TROUBLE SHOOTING AIDS

## SWEEP

### HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage."

INSUFFICIENT SWEEP

Check by substitution V20, V21 and V23. Check adjustments B2, B3 and B4. Check T3, T5A, R107, R108, R104, C86 and other associated components.

DRIVE LINES

Check by substitution V20 and V21. Check adjustments B2 and B4. Check R107, R108, T3, T5A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V20 and V21. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines."

PIE CRUST EFFECT

Check by substitution V19, V20 and V21. Check C82 for open. Check L36, C81, R92, R98 and other associated components.

XMAS TREE EFFECT

Check by substitution V19, V20 and V21. Check T3 and T5 for internal arcing. Check L36, C83, C80, R94, R95, R103 and other associated components.

### VERTICAL

LOSS OF SWEEP

Substitute V17. Check waveform W11.

| If Satisfactory | If Unsatisfactory |
|---|---|
| Check T4, T5B, R111, R89, C2B and other associated components. | Check T2, C74, R7, R87 and other associated components. |

INSUFFICIENT SWEEP

Substitute V17. Check height and vertical linearity controls for proper operation. Check R87, T4 and other associated components.

COMPRESSED AT BOTTOM

Substitute V17. Check R87, R7, C74 and other associated components.

COMPRESSED AT TOP

Substitute V17. Check R89, R8, C2B, T4 and other associated components.

FOLDS

Substitute V17. Check C72, C73, R88, T2, T4, T5B and other associated components.

## SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V16 and V8. Check C66, C68, R76, R77, R78 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V17. Check vertical integrator network. Check C70, C71, R83, T2 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V18 and V19. Check C77, C78, C81, C82, C83, R92, R98 and other associated components.

HORIZONTAL BENDING

Check by substitution V8, V16, V18 and V19. Check horizontal AFC network.

## VIDEO

LOSS OF VIDEO

Check by substitution V8 and V9. Check C49, C50, R42, R41, R45, R46, L29, L32 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A9. Check video IF alignment.

POOR CONTRAST

Check by substitution V8 and V9. Check contrast control. Check L26, L30, L31, C49, C50 and other associated components.

NEGATIVE PICTURE

Check by substitution V8 and V9. Check picture tube. Check C49, C50 and other associated components.

SMEAR

Check by substitution V8 and V9. Check L26, L27, L29, L30, L31, R45, R46, C49, C50 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6, V7, V8 and V9 for heater to cathode leakage.

## AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12, V13, V14 and V15. Check stages V14 and V15 using audio signal generator. Apply audio signal across R1B.

| If Satisfactory | If Unsatisfactory |
|---|---|
| Check ratio detector and audio IF stages for component failure or change of value. | Check C60, C63, C64, C65, C3C, R69, R71, R70, T8, speaker and other associated components. |

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A14 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or no Sound."

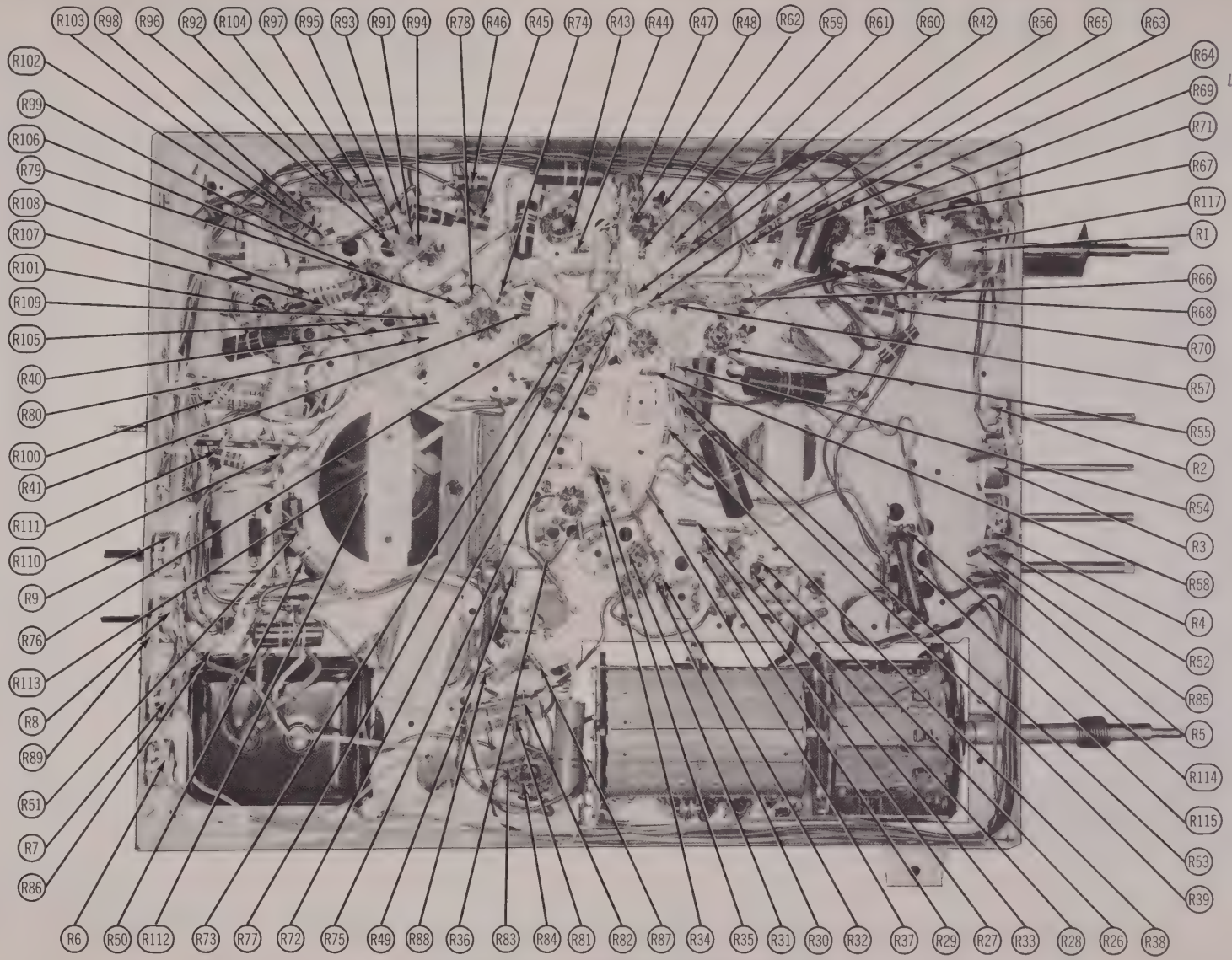
## POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, substitute V23. Check B+ filter and decoupling network.

SMALL AND/ON DIM PICTURE

Substitute V23. Check B+ filter and decoupling network.




PROPERTY OF
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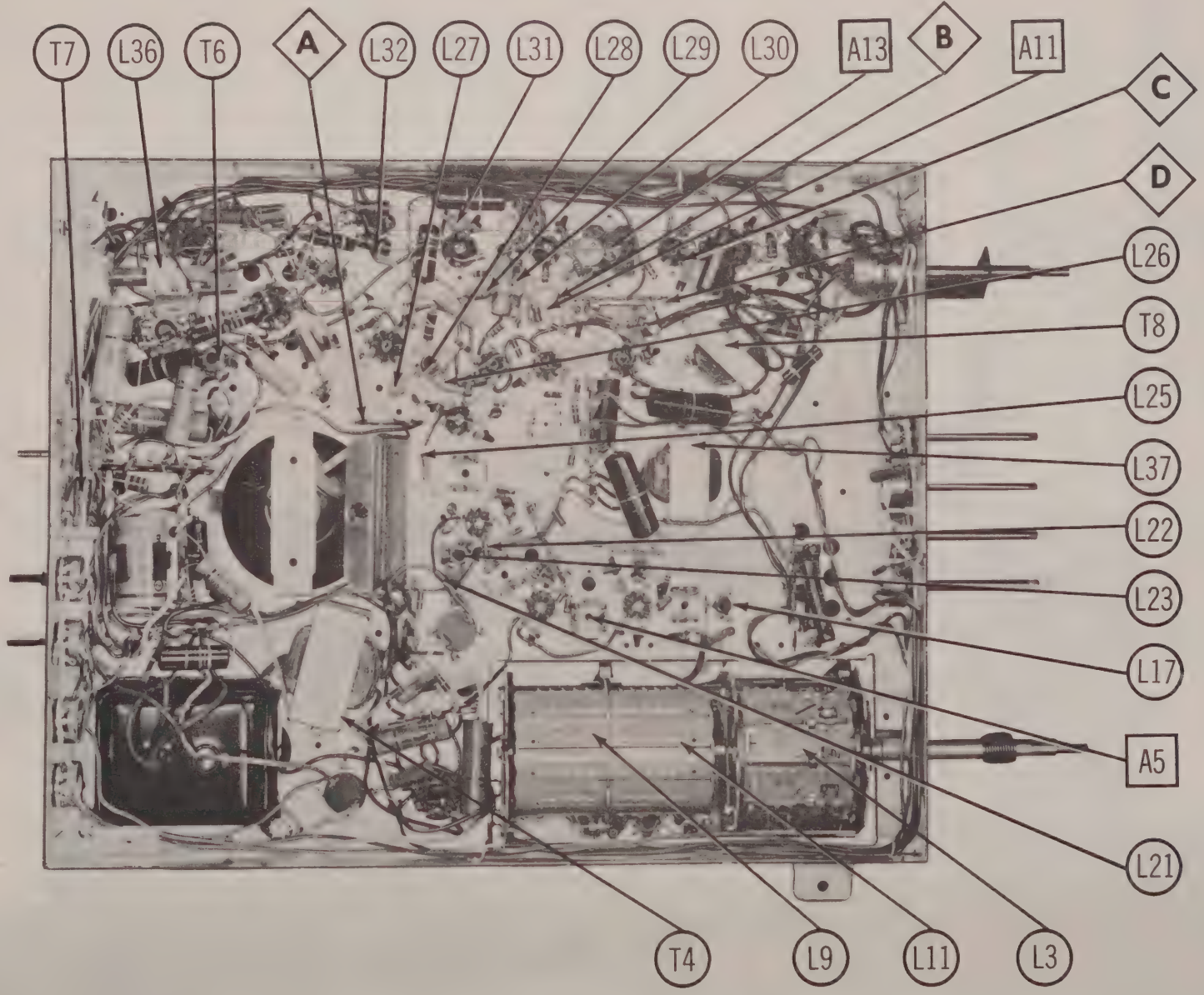
3924 MEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION




CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No. | USE | REPLACEMENT DATA | | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| | | AIRLINE PART No. | STANDARD REPLACEMENT | | |
| V1 | UHF Osc. | 6AF4 | 6AF4 | 7DK | |
| V2 | VHF RF Amp. | 6BZ7 | 6BZ7 | 9AJ | |
| V3 | VHF Mixer-Osc. | 6U8 | 6U8 | 9AE | |
| V4 | 1st. Video IF Amp. | 6CB6 | 6CB6 | 7CM | |
| V5 | 2nd. Video IF Amp. | 6CB6 | 6CB6 | 7CM | |
| V6 | 3rd. Video IF Amp. | 6CB6 | 6CB6 | 7CM | |
| V7 | Video Det.- DC Restorer | 6AL5 | 6AL5 | 6BT | |
| V8 | Video Amp.- Sync Phase Inv. | 12AT7 | 12AT7 | 9A | |
| V9 | Video Output | 12BY7 | 12BY7 | 9BF | |
| V10 | AGC Keying | 6AU6 | 6AU6 | 7BK | |
| V11 | 1st. Sound IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V12 | 2nd. Sound IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V13 | Ratio Det. | 6AL5 | 6AL5 | 6BT | |
| V14 | AF Amp.- AGC Clamper | 6AV6 | 6AV6 | 7BT | |
| V15 | Audio Output | 6AQ5 | 6AQ5 | 7BZ | |
| V16 | Sync Separator | 6CS6 | 6CS6 | 7CH | |
| V17 | Vert. Osc.- Vert. Output | 6SN7GTA | 6SN7GTA | 8BD | |
| V18 | Horiz. AFC | 6AL5 | 6AL5 | 6BT | |
| V19 | Horiz. Mult. | 6SN7GTA | 6SN7GTA | 8BD | |
| V20 | Horiz. Output | 6CU6 | 6CU6 | 6AM | 6BQ6TA used as alternate |
| V21 | Damper | 6AX4GT | 6AX4GT | 4CG | |
| V22 | HV Rectifier | 1B3GT | 1B3GT | 3C | |
| V23 | LV Rectifier | 5U4GA | 5U4GA | 5T | |

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## CATHODE-RAY TUBE

| ITEM No. | REPLACEMENT DATA | | | | | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|---|---|
| | AIRLINE PART No. | CBS PART No. | GENERAL ELECTRIC PART No. | SYLVANIA PART No. | WESTINGHOUSE PART No. | | |
| V24 | 21ZP4B ① | 21ZP4B ① | 21ZP4B ① | 21ZP4B ② | 21ZP4B ① | 12N | ① Aluminized |
| | | 21ZP4A | 21ZP4A | 21ZP4A | 21ZP4A | 12N | ② Silver Screen |
| | | | | 21ZP4 ③ | | 12D | ③ Circuit Change Necessary |
| | 21AWP4 | 21AWP4 | | | 21AWP4 | 12N | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | AIRLINE PART No. | MALLORY PART No. | PYRAMID PART No. | SANGAMO PART No. | |
| C1A | ▲80 | 400 | 45X390 | FP229.4 | TM-D80-450 | T-180 | |
| B | ▲60 | 400 | | | | | |
| C2A | ▲80 | 400 | 45X391 | FP229.8 | TM-3057 | T-720 | |
| B | ▲100 | 50 | | | | | |
| C3A | ■20 | 400 | 45X392 | | TM-D20-450 | D-215 | |
| B | ▲20 | 400 | | | TD-50-50 | MT-0550 | |
| C | 40 | 50 | | | | | |
| C4 | 5 | 25 | 45X378 | TC30 | TD-5-25 | MMT-0505 | |
| C5 | 4 | 100 | 45X361 | TC40 | TD-4-150 | MT-1504 | |
| C6 | 30 | 400 | 45X393 | TC77 | TD-30-450 | FM-4530 | |
| C7 | 5 | 25 | 45X378 | TC30 | TD-5-25 | MMT-0505 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | AIRLINE PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | |
| C8A | 1 | | | | | | |
| B | 2 | | | | | | |
| C9 | 120 | | | DD-121 | 811-121 | UC-5312 | |
| C10 | 800 | | 13M-23E801Z | MFT-1000 | | | |
| C11 | 800 | | 13M-23E801Z | MFT-1000 | | | |
| C12 | 10 | | 13M-20A-100D-N-1 | | | | |
| C13 | 3-8 | | | 829-10 | | | |
| C14 | 1500 | | 13L-8XA152Z | DD-152 | 801-0015 | DC-5215 | |
| C15 | 3 | | 13L-8C030H | TCZ-3R3 | NP0A-030 | ZT-5533 | |
| C16 | .5-3 | | 31A-056-1 | 829-3 | 3115-01-0R5 | CT565A | |
| C17 | 1.5 | | 13L-831R5C | TCZ-1R5 | NP0A-1R5 | ZT-5515 | |
| C18 | 800 | | 13M-23E801Z | | | | |
| C19 | 47 | | 13L-80470K | DD-470 | 831-470 | UC-5447 | |
| C20 | 800 | | 13M-23E801Z | | | | |
| C21 | 800 | | 13M-23E801Z | | | | |
| C22 | 47 | | 13M-20U470K | MFT-50 | | | |
| C23 | .5-3 | | 31A-056-1 | 829-3 | 3115-01-0R5 | CT565A | |
| C24 | 10 | | 13L-8U100F | TCN-10 | N750K-100 | NT-541 | |
| C25 | 5 | | 13L-8UA050C | | | | |
| C26 | .5-3 | | 31A-056-1 | 829-3 | 3115-01-0R5 | CT565A | |
| C27 | 1500 | | 13L-8XA152Z | DD-152 | 801-0015 | DC-5215 | |
| C28 | 1500 | | 13L-8XA152Z | DD-152 | 801-0015 | DC-5215 | |
| C29 | 800 | | 13M-23E801Z | | | | |
| C30 | 220 | | 13L-12D221K | DD-221 | 811-221 | UC-5322 | |
| C31 | .22 | 200 | RCP10M2224M | | | PT4022 | |
| C32 | 36 | | 47X626 | | | | |
| C33 | 47 | | 47X603 | D6-470 | GP1K-470 | UC-5447 | |
| C34A | 1000 | | 80X3 | DD2-102 | 812-001 | DCD-521 | |
| B | 1000 | | | | | | |
| C35 | 680 | | 80X5 | DD-681 | 811-681 | UC-5368 | |
| C36 | 1000 | | 80X1 | DD-102 | 801-001 | DC-521 | |
| C37A | 1000 | | 80X3 | DD2-102 | 812-001 | DCD-521 | |
| B | 1000 | | | | | | |
| C38 | .22 | 200 | RCP10M2224M | | | PT4022 | |
| C39 | 680 | | 80X5 | DD-681 | 811-681 | UC-5368 | |
| C40 | 1.5 | | 47X584 | TCZ-1R5 | NP0A-1R5 | ZT-5515 | |
| C41 | 150 | 500 | RCM15E151K | D6-151 | 811-151 | MCB236 | |
| C42 | 470 | | 80X4 | DD-471 | 831-471 | UC-5347 | Note 1 |
| C43 | 470 | | 80X4 | DD-471 | 831-471 | UC-5347 | |
| C44 | 1000 | | 80X1 | DD-102 | 801-001 | DC-521 | |
| C45 | 1000 | | 80X1 | DD-102 | 801-001 | DC-521 | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CAPACITORS (cont)

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA AIRLINE PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C46 | 1000 | | 80X1 | DD-102 | 801-001 | DC-521 | |
| C47 | 5 | | 47X563 | TCZ-4R7 | NP0A-050 | ZT-555 | |
| C48 | 360 | 500 | 47X568 | TCN-360 | N750-333-363 | | |
| C49 | .047 | 400 | RCP10M4473M | DF-503 | | PT4147 | |
| C50 | .1 | 400 | RCP10M4104M | DF-104 | | PT401 | |
| C51 | .1 | 200 | RCP10M2104M | DF-104 | | PT401 | |
| C52 | 1000 | | 80X1 | DD-102 | 801-001 | DC-521 | |
| C53 | 1.5 | | 47X564 | TCZ-1R5 | NP0A-1R5 | ZT-5515 | |
| C54A | 10000 | | 80X6 | DD3-103 | 811-01 | DC-511 | |
| B | 10000 | | | | 811-01 | DC-511 | |
| C55 | 100 | | 47X604 | D6-101 | GP1K-101 | DC-521 | |
| C56 | 5000 | | 47X507 | DD-502 | 811-005 | DC-521 | |
| C57 | 5000 | | 47X507 | DD-502 | 811-005 | DC-521 | |
| C58 | 330 | 500 | 47X570 | D6-331 | 811-331 | UC-5333 | |
| C59 | 470 | 500 | 47X535 | D6-471 | 831-471 | UC-5347 | |
| C60 | .047 | 400 | RCP10M4473M | DF-503 | | PT4147 | |
| C61 | .0047 | 400 | RCP10M4472M | D6-472 | GP2-333-472 | PT6247 | |
| C62 | .0047 | 400 | RCP10M4472M | D6-472 | GP2-333-472 | PT6247 | |
| C63 | 5000 | | 47X507 | DD-502 | 811-005 | DC-525 | |
| C64A | 10000 | | | | | | |
| B | 250 | | †76X5 | †PC-80 | †1404-01 | | |
| C | | | | | | | |
| C65 | .0047 | 600 | RCP10M6472M | D6-472 | GP2-333-472 | PT6247 | |
| C66 | .01 | 400 | RCP10M4103M | D6-103 | GP2-333-103 | PT411 | |
| C67 | 1000 | | 80X1 | DD-102 | 801-001 | DC-521 | |
| C68 | .047 | 400 | RCP10M4473M | DF-503 | | PT4147 | |
| C69A | 2000 | | | | | DC-532 | |
| B | 5000 | | ♦76X7 | ♦PC-100 | ♦1405-01 | DC-535 | |
| C | 5000 | | | | | DC-525 | |
| C70 | 4700 | 500 | 47X543 | | | MCE465 | |
| C71 | .022 | 200 | RCP10M2223M | DF-203 | 817-02 | PT4122 | |
| C72 | .047 | 600 | RCP10M6473M | DF-503 | | PT6147 | |
| C73 | .022 | 200 | RCP10M2223M | DF-203 | 817-02 | PT4122 | |
| C74 | .1 | 600 | RCP10M6104M | DF-104 | | PT601 | |
| C75 | .047 | 600 | RCP10M6473M | DF-503 | | PT6147 | |
| C76 | .015 | 600 | RCP10M6153M | DD6-153 | | PT6115 | |
| C77 | 1000 | | 80X1 | DD-102 | 801-001 | DC-521 | |
| C78 | 1000 | | 80X1 | DD-102 | 801-001 | DC-521 | |
| C79 | .01 | 400 | RCP10M4103M | D6-103 | GP2-333-103 | PT411 | |
| C80 | 270 | 500 | RCM20A271K | D6-271 | GP2K-271 | MC241 | |
| C81 | .0047 | 400 | RCP10M4472M | D6-472 | GP2-333-472 | PT6247 | |
| C82 | .047 | 200 | RCP10M2473M | DF-503 | | PT4147 | |
| C83 | 4700 | 500 | 47X543 | | | MCE465 | |
| C84 | 390 | 500 | RCM20B39IJ | TCN-390 | N750-334-392 | MCE243 | |
| C85 | .1 | 400 | RCP10M4104M | DF-104 | | PT401 | |
| C86 | 330 | 500 | 47X570 | D6-331 | 811-331 | | |
| C87 | .047 | 400 | RCP10M4473M | DF-503 | | PT4147 | |
| C88 | .1 | 400 | RCP10M4104M | DF-104 | | PT401 | |
| C89 | .047 | 400 | RCP10M4473M | DF-503 | | PT4147 | |
| C90 | .15 | 400 | RCP10M4154M | | | PT4015 | |
| C91 | 500 | 20000 | 47X560 | TV3-502 | 413 | HV20035A | |
| C92 | 10000 | | 47X615 | DD-103 | 811-01 | DC-511 | |
| C93 | 10000 | | 47X615 | DD-103 | 811-01 | DC-511 | |

Note 1. Some versions use 680MMF in this application (part #80X5).
† Items C64A, C64B, C64C, R69A and R69B are combined in one unit.
When replacing items separately, C64B and C64C should total 2500MMF.
♦ Items C69A, C69B, C69C, R80A, R80b and R80C are combined in one unit.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA AIRLINE PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 1000Ω | ½ | 78X21 | ♦QJ-838 | RTY-502 | F1-4 | UF13L | Contrast (Panel) |
| B | 1Meg | ½ | | | | R2-59 | UR16-T254 | Volume (Rear) Attach to R1A. |
| C | Switch | | | | | KB-3 | US-37 | Attach to R1B. |
| R2A | 50KΩ | ½ | 40X361 | Q11-123 | A47-50K-S | AB-31 | U-35 | Horizontal Hold |
| B | Shaft | | Not Req. | NQ | R8-3/16 | AK-4 | Not Req. | Attach to R2B. |
| R3A | 1.5Meg | ½ | 40X334 | Q11-138 | A47-1.5Meg-S | AB-75 | U-155 | Tone |
| B | Shaft | | Not Req. | NQ | R8-3/16 | AK-4 | Not Req. | Attach to R3B. |
| R4A | 500KΩ | ½ | 40X333 | Q11-133 | A47-500K-S | AB-59 | U-50 | Brightness |
| B | Shaft | | Not Req. | NQ | R8-3/16 | AK-8 | Not Req. | Attach to R4B. |
| R5A | 1.5Meg | ½ | 40X334 | Q11-138 | A47-1.5Meg-S | AB-60 | U-155 | Vertical Hold |
| B | Shaft | | Not Req. | NQ | R8-3/16 | AK-4 | Not Req. | Attach to R5B. |
| R6A | 2.5Meg | ½ | 40X369 | Q11-239 | A47-2.5Meg-S | AB-83 | TA255L | AGC |
| B | Shaft | | Not Req. | NQ | FK8-1/4 | AK-1 | Not Req. | Attach to R6B. |
| R7A | 2.5Meg | ½ | 40X369 | Q11-239 | A47-2.5Meg-S | AB-83 | TA255L | Height |
| B | Shaft | | Not Req. | NQ | FK8-1/4 | AK-1 | Not Req. | Attach to R7B. |
| R8A | 8000Ω | ½ | 40X375 | Q11-116 | A47-10K-S | AB-84 | TA4L | Vertical Linearity |
| B | Shaft | | Not Req. | NQ | FK8-1/4 | AK-1 | Not Req. | Attach to R8B. |
| R9A | 7.5Meg | ½ | 40X370 | Q11-142 | A47-7.5Meg-S | AB-89 | U-83 | Sync Stability |
| B | Shaft | | Not Req. | NQ | FK8-1/4 | AK-4 | Not Req. | Attach to R9B. |

♦CONCENTRIKIT EQUIVALENT: K-4 KIT, BASE ELEMENTS AND SHAFTS, B11-108, P6-218 (Panel)
B13-137X, R16-313 (Rear)
76-2 (Switch)

## RESISTORS

| ITEM No. | RATING OHMS | RATING WATT | REPLACEMENT DATA AIRLINE PART No. | IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R10 | 100Ω | ½ | 12TAE101K | BTS-100 | |
| R11 | 10KΩ | ½ | 12TAE103K | BTS-10K | |
| R12 | 1000Ω | ½ | 12TAE102K | BTS-1000 | |
| R13 | 22KΩ | ½ | 12TAE223K | BTS-22K | |
| R14 | 47KΩ | ½ | 12TAE473M | BTS-47K | |
| R15 | 270KΩ | ½ | B84274 | BTS-270K | |
| R16 | 180KΩ | ½ | B84184 | BTS-180K | |
| R17 | 680Ω | ½ | 12TAE681K | BTS-680 | |
| R18 | 6800Ω | ½ | 12TAE682K | BTS-6800 | |
| R19 | 100KΩ | ½ | 12TAE104K | BTS-100K | |
| R20 | 100KΩ | ½ | 12TAE104K | BTS-100K | |
| R21 | 10KΩ | ½ | 12TAE103M | BTS-10K | |
| R22 | 3300Ω | 1 | 12SAE332K | BTA-3300 | |
| R23 | 100KΩ | ½ | 12TAE104K | BTS-100K | |
| R24 | 8200Ω | ½ | 12TAE822K | BTS-8200 | |
| R25 | 33KΩ | ½ | 12TAE333M | BTS-33K | |
| R26 | 3300Ω 5% | ½ | B83332 | | |
| R27 | 47Ω | ½ | B8547T | BTS-470 | |
| R28 | 47Ω 5% | ½ | B83470 | BTS-47 5% | |
| R29 | 1000Ω | ½ | B83102 | BTS-1000 | |
| R30 | 39KΩ 5% | ½ | B83393 | | |
| R31 | 470Ω | ½ | B8547I | BTS-470 | |
| R32 | 47Ω 5% | ½ | B83470 | BTS-47 5% | |
| R33 | 150Ω | ½ | B8515I | BTS-150 | |
| R34 | 39K 5% | ½ | B83102 | | |
| R35 | 1500Ω | ½ | B84152 | BTS-1500 | |
| R36 | 180Ω | ½ | B83392 | BTS-180 | |
| R37 | 150Ω | ½ | B8515I | BTS-150 | |
| R38 | 100K | ½ | B84104 | BTS-100K | |
| R39 | 330K 5% | ½ | B83334 | BTS-330K 5% | |
| R40 | 3900Ω 5% | ½ | B83392 | | |
| R41 | 5600Ω | 1 | C84562 | | |
| R42 | 1500Ω | ½ | B84152 | BTS-1500 | |
| R43 | 1Meg | ½ | B84105 | | |

## RESISTORS (cont)

| ITEM No. | RATING OHMS | RATING WATT | REPLACEMENT DATA AIRLINE PART No. | IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R44 | 68Ω | ½ | B84680 | BTS-68 | |
| R45 | 2000Ω | 2 | D83202 | BTB-2000 | |
| R46 | 2000Ω | 2 | D83202 | BTB-2000 | |
| R47 | 100KΩ | ½ | B84104 | | |
| R48 | 1Meg | ½ | B84105 | BTS-2200 | |
| R49 | 2200Ω | ½ | B84222 | | |
| R50 | 22KΩ | ½ | B84233 | | |
| R51 | 100KΩ | ½ | B85104 | | |
| R52 | 47KΩ | ½ | B85473 | | |
| R53 | 2.7Meg | ½ | B84275 | BTS-2.7Meg | |
| R54 | 470KΩ | ½ | B84474 | BTS-470K | |
| R55 | 47KΩ | ½ | B84473 | | |
| R56 | 33KΩ | ½ | B84333 | | |
| R57 | 1000Ω | ½ | B85102 | BTS-1000 | |
| R58 | 100Ω | ½ | B84101 | BTS-100 | |
| R59 | 56KΩ | ½ | B84563 | BTS-56K | |
| R60 | 1000Ω | ½ | B85103 | BTS-1000 | |
| R61 | 33KΩ | ½ | B84333 | BTS-33K | Note 1 |
| R62 | 33KΩ | ½ | B84333 | BTS-33K | |
| R63 | 10KΩ 5% | ½ | B83103 | BTS-10K 5% | |
| R64 | 10KΩ 5% | ½ | B83103 | BTS-10K 5% | |
| R65 | 2700 | ½ | B84271 | BTS-270 | |
| R66 | 68KΩ | ½ | B84683 | BTS-68K | |
| R67 | 10Meg | ½ | B85106 | BTS-10Meg | |
| R68 | 56KΩ | ½ | B84563 | BTS-56K | |
| R69A | 500KΩ | ½ | †76X5 | BTS-470K | |
| B | 500KΩ | ½ | | BTS-470K | |
| R70 | 1000Ω | 2 | D84102 | BTB-1000 | |
| R71 | 330Ω | 1 | C84331 | BTA-330 | |
| R72 | 47KΩ | ½ | B84473 | | |
| R73 | 270KΩ | ½ | B84274 | | |
| R74 | 10KΩ | ½ | B84103 | | |
| R75 | 1.5Meg | ½ | B84155 | | |
| R76 | 820KΩ | ½ | B84824 | | |
| R77 | 68KΩ | ½ | B84683 | | |
| R78 | 3300Ω 5% | ½ | B83332 | | |
| R79 | 3300Ω 5% | ½ | B83332 | | |
| R80A | 22KΩ | ½ | | | |
| B | 8200Ω | ½ | ♦76X7 | | |
| C | 8200Ω | ½ | | | |

Note 1. In some versions, a 100K ½W resistor is used in this application.
† Items C64A, C64B, C64C, R69A, R69B are combined in one unit.
♦ Items C69A, C69B, C69C, R80A, R80B, R80C are combined in one unit.

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA AIRLINE PART No. | Halldorson PART No. | Merit PART No. | RCA TYPE No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117VAC | 605VCT | 5VAC | 53X339A | P9715 ④ | P-2836 ① | | P-8333 ② | | P-49BS ③ |
| | | ② 1.74A | .240ADC | | | | | | | |
| | | | ③ 3A | | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3VAC | | | | | | | | | |
| | ⑤ 9.5A | | | | | | | | | |

① Parallel and phase 6.3V ⑤ 5.8A windings for Sec. 3. Tape 6.3V ④ 3.3A, and 6.3V ⑤ .85A windings.
② Tape small 6.3V winding.
③ Parallel and phase 6.3V ⑤ 9A and .9A windings for Sec. 3.
④ Use 8V taps on Sec. 1. Tape other taps, parallel and phase 6.3V windings for Sec. 3.

## TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA AIRLINE PART No. | Halldorson PART No. | Merit PART No. | RCA TYPE No. | Ram PART No. | Stancor PART No | Thordarson PART No. | Triad PART No |
|---|---|---|---|---|---|---|---|---|---|
| T2 | Vert. Osc. Trans. | 54X310 | B6702 | A-3003 | 209T1 ① | V405 | A-8125 | 26A03 | A-97X |
| T3 | Horiz. Output Trans. | 53X330 | FB440 * | HVO-41 * | 232T1 & 212R1 ③ | X110 | A-8264 & WC-5 ② * | FLY-37 * | D-35 & WC-12 ③ * |
| T4 | Vert. Output Trans. | 51X168 | Z1806 ① | A-3039 ① | 226T1 ① | V312 ① | A-8141 ① | 26S54 ① | A-104X ① |
| T5A | Yoke-Horiz. (13MH) Vert. (46MH) | 9A2334-1 | DF802 | MDF-72 | 21D2 | Y7DF14 | DY-9A | Y-4 | Y-17 |
| B | | | | | | | | | |
| T6 | Horiz. Lin. Coil (1.2-6.6MH) | 9A2262 | RF800 ②③ | MWC-5 ② | 213R1 | 20IR15 | WC-8 | WC-22 | WC-12 ④ |
| T7 | Width Coil (1-6MH) | 9A2183 | | | 20IR4 ⑤ | 20IR4 | WC-4 ⑤ | WC-15 ⑤ | |

① Drill new mounting hole(s).
② Enlarge mounting hole.
③ Connect to terminals #3 and #4.
④ Connect to coded blue and green terminals.
⑤ Drill new mounting hole or use original bracket, slider and core.

## *HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

| | ORIGINAL TERMINAL CONNECTIONS | Halldorson Replacement Connections | Merit Replacement Connections | RCA Replacement Connections | Ram Replacement Connections | Stancor Replacement Connections | Thordarson Replacement Connections | Triad Replacement Connections |
|---|---|---|---|---|---|---|---|---|
| | 6 | 13 | 13 | 10 | 13 | 13 | 13 | 10 |
| | 5 | Jumper #10 & #11 | Jumper #10 & #11 | 8 | Jumper #10 & #11 | Jumper #10 & #11 | Jumper #10 & #11 | 8 |
| | 4 | 6 | 6 | 7 | 6 | 6 | 6 | 7 |
| | 3 | 4 | 4 | See Note ⑤ | 4 | 4 | 4 | See Note ⑤ |
| | 2 | 2 | 2 | NC | 2 | 2 | 2 | NC |
| | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 3 |
| | A | 9 | 9 | 2 | 9 | 9 | 9 | 2 |
| | G | 8 | 8 | 1 | 8 | 8 | 8 | 1 |
| Connect Width Coil Across → | 1 & 2 | 1 & 2 | 1 & 2 | 212R1 Across #1 & #2 | 1 & 2 | 1 & 2 | 1 & 2 | WC-12 (Red & Blue terminals) across #1 & #2 |
| Special Notes → | | | | ⑤ | | | | ⑤ |

⑤ No connection to transformer, connect a damping capacitor (approximately 47-68MMF ⑥ 2KV) in series with R110 across horizontal yoke terminals #3 and #7.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA AIRLINE PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| T8 | 5.1KΩ | 3.5Ω | 51X166B | Z1107 | A-2930 | A-3877 | 24S51 | S-3X | |

## SPEAKER

| ITEM No. | RATINGS SIZE | RATINGS FIELD | RATINGS V. C. IMP. | REPLACEMENT DATA AIRLINE PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 10" | PM | 3.5Ω | 12AS19 | 10A31 | |

## COILS (RF-IF)

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA AIRLINE PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | UHF Ant. Coil | 0Ω | | | | | | |
| L2 | UHF Ant. Coil | 0Ω | | | | | | |
| L3A | UHF Ant., Mixer, Osc. Coils | 0Ω | | 9A2331-10 | | | | Channels 10 thru 19 |
| B | UHF Ant., Mixer, Osc. Coils | 0Ω | | 9A2331-20 | | | | Channels 20 thru 29 |
| C | UHF Ant., Mixer, Osc. Coils | 0Ω | | 9A2331-30 | | | | Channels 30 thru 39 |
| D | UHF Ant., Mixer, Osc. Coils | 0Ω | | 9A2331-40 | | | | Channels 40 thru 49 |
| E | UHF Ant., Mixer, Osc. Coils | 0Ω | | 9A2331-50 | | | | Channels 50 thru 59 |
| F | UHF Ant., Mixer, Osc. Coils | 0Ω | | 9A2331-60 | | | | Channels 60 thru 69 |
| G | UHF Ant., Mixer, Osc. Coils | 0Ω | | 9A2331-70 | | | | Channel 70 thru 79 |
| H | UHF Ant., Mixer, Osc. Coils | 0Ω | | 9A2331-80 | | | | Channel 80 thru 83 |
| L4A | Fil. Choke | 0Ω | | 31K-137-07 | | | | |
| B | Fil. Choke | 0Ω | | 31K-137-07 | | | | |
| L5 | Cathode Choke | 0Ω | | 31K-137-02 | | | | |
| L6 | RF Choke | 0Ω | | | | | | |
| L7 | UHF Coupling | 0Ω | | | | | | |
| L8 | RF Choke | 0Ω | | | | | | |
| L9A | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-2 | | | | Channel 2 |
| B | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-3 | | | | Channel 3 |
| C | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-4 | | | | Channel 4 |
| D | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-5 | | | | Channel 5 |
| E | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-6 | | | | Channel 6 |
| F | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-7 | | | | Channel 7 |
| G | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-8 | | | | Channel 8 |
| H | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-9 | | | | Channel 9 |
| I | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-10 | | | | Channel 10 |
| J | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-11 | | | | Channel 11 |
| K | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-12 | | | | Channel 12 |
| L | VHF Ant. Coil | 0Ω | 0Ω | 9A2329-13 | | | | Channel 13 |
| L10 | Neut. Coil | 0Ω | | | | | | |
| L11A | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-2 | | | | Channel 2 |
| B | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-3 | | | | Channel 3 |
| C | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-4 | | | | Channel 4 |

AIRLINE MODELS
WG-5102A, WG-5103A

# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (cont)

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA AIRLINE PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| D | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-5 | | | | Channel 5 |
| E | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-6 | | | | Channel 6 |
| F | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-7 | | | | Channel 7 |
| G | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-8 | | | | Channel 8 |
| H | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-9 | | | | Channel 9 |
| I | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-10 | | | | Channel 10 |
| J | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-11 | | | | Channel 11 |
| K | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-12 | | | | Channel 12 |
| L | VHF RF, Mixer Grid, Osc. Coil | 0Ω | | 9A2330-13 | | | | Channel 13 |
| L12 | UHF IF Coil | .2Ω | | | | | | |
| L13 | UHF IF Coil | .1Ω | .3Ω | | | | | |
| L14 | UHF IF Coil | .1Ω | .3Ω | | | | | |
| L15 | Fil. Choke | 0Ω | | 34A-575 | | | | |
| L16 | Conv. Plate | .1Ω | | 31K-264 | | | | |
| L17 | IF Trap | .1Ω | | 9A2320 | | | | |
| L18 | 1st. Video IF | .1Ω | | 9A2316 | | | | |
| L19 | 2nd. Video IF | .2Ω | .2Ω | 9A2317 | | TV-128 | 6218 | Includes 47.25MC trap |
| L20 | 3rd. Video IF | .2Ω | .2Ω | 9A2318 | 17-5003 * | TV-128 * | 6233 * | |
| L21 | Fil. Choke | 0Ω | | 9A2033 | 19-1002 | | 4606 | 2.2 Microhenries |
| L22 | Parasitic Suppressor | 0Ω | | 9A2322 | | | | 1 turn heavy wire wound on 10Ω resistor |
| L23 | Cathode Trap | 0Ω | 0Ω | 9A2321 | | | | |
| L24 | 4th. Video IF | .5Ω | .5Ω | 9A2319 | 17-5004 | TV-125 | 6234 | |
| L25 | Fil. Choke | 0Ω | | 9A2033 | 19-1002 | | 4606 | 2.2 Microhenries |
| L26 | Series Peaking Coil | 7Ω | | 36A10 | 19-4060 | | 6172 ■ | 60 Microhenries, wound on 22KΩ resistor |
| L27 | Shunt Peaking Coil | 18Ω | | 36A22 | 19-3300 | TV-185 | 6155 | 290 Microhenries |
| L28 | 4.5MC Trap | .3Ω | | 9A2074 | 20-1004 | TV-151 | 1470 | |
| L29 | Shunt Peaking Coil | 9.5Ω | | 36A1 | 19-3100 | TV-181 | 6177 | 100 Microhenries |
| L30 | Shunt Peaking Coil | 10Ω | | 36A25 | 19-3100 ▲ | TV-181 ▲ | 6177 ▲ | 100 Microhenries, wound on 470Ω resistor |
| L31 | Series Peaking Coil | 12.5Ω | | 36A12 | 19-4160 | TV-184 ■ | 6180 ■ | 160 Microhenries, wound on 22KΩ resistor |
| L32 | Shunt Peaking Coil | 13.5Ω | | 36A2 | 19-3180 | TV-184 | 6154 | 190 Microhenries |
| L33 | 1st. Sound IF | 2Ω | | 9A2201 | 17-1031 ♦ | TV-113 ▪ | 6203 ▪ | |
| L34 | 2nd. Sound IF | 2.4Ω | 2Ω | 9A2323 | 17-3495 | TV-113 | 6203 | |
| L35 | Ratio Det. | 4.2Ω | .6ΩCT | 9A2295 | 17-3497 | TV-115 | 6205 | Tertiary winding -.5Ω |
| L36 | Horiz. Osc. | 63Ω | | 9A2096 | 19-1576 | TV-163 | 6210 | |

* Detune trap.
■ Parallel with 22KΩ resistor.
▲ Parallel with 470Ω resistor.
♦ Drill mounting holes.
▪ Use one winding.

## FILTER CHOKE

| ITEM No. | RATINGS TOTAL DIRECT CURRENT | RATINGS D. C. RESISTANCE | RATINGS INDUCTANCE (0 CURRENT 1000 ~) | REPLACEMENT DATA AIRLINE PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|
| L37 | .240ADC | 39.6Ω | 1.06HY | 52X96 | C-5037 ① | C-2996 ① | C-2326 ① | 26C44 | C-23X ① |

① Drill one new mounting hole.

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA AIRLINE PART No. FUSE | AIRLINE PART No. HOLDER | LITTELFUSE PART No. FUSE | LITTELFUSE PART No. HOLDER | BUSS PART No. FUSE | BUSS PART No. HOLDER |
|---|---|---|---|---|---|---|---|---|
| M1 | 3AG S/B | 4/10A 125V | 16X147-3 | 16X146 | 313.400 (3AG S/B 410A) | 357001 | MDL 4/10 | 4405 |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA AIRLINE PART No. | REPLACEMENT DATA SYLVANIA PART No. | NOTES |
|---|---|---|---|---|
| M2 | 1N82A* | 31K-111 | 1N82 or 1N82A | UHF Mixer |

*Some versions may use type 1N82 crystal diode in this application.

# PARTS LIST AND DESCRIPTIONS (Continued)

## MISCELLANEOUS

| ITEM No. | PART NAME | AIRLINE PART No. | NOTES |
|---|---|---|---|
| M3 | Dial Light | 7A32 | Type #51 |
| M4 | Tuner | 25A1124 | VHF-UHF combination |
| | Tuner | 25A1128 | VHF-UHF combination |
| M5 | Trap | 31K-225-03 | VHF antenna input filter |
| M6 | Focus Magnet | 2A438-2 | Includes centering device |
| M7 | Ion Trap | 2A421 | |
| | Contact Board Assembly | 31K-213 | Tuner - Includes L12, L13 and L14 |
| B2 | Trimmer Cap | 17A269 | Horiz. Drive (120-400MMF) |
| | Knob | 10A851-1 | UHF channel selector -Maroon-Model WG-5102A |
| | Knob | 10A849-1 | VHF channel selector -Maroon - Model WG-5102A |
| | Knob | 10A831-1 | Contrast - Maroon-Model WG-5102A |
| | Knob | 10A830-1 | On-off-volume-maroon - Model WG-5102A |
| | Knob | 10A851-2 | UHF channel selector -beige - Model WG-5103A |
| | Knob | 10A849-2 | VHF channel selector -beige - Model WG-5103A |
| | Knob | 10A831-2 | Contrast - beige - Model WG-5103A |
| | Knob | 10A830-2 | On-off-volume-beige - Model WG-5103A |
| | Lever Arm | 37X343 | Fine tuning - All models |
| | Spring | 28X611 | Lever arm |
| | Escutcheon | S-4X28-1 | Control panel assy.-Model WG-5102A |
| | Escutcheon | S-4X28-2 | Control panel assy.-Model WG-5103A |
| | Safety Glass | 17X180 | |
| | Mask | 4X1230-6 | |
| | Rear Cover | S-14X88 | Includes power cord |

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# TROUBLE SHOOTING AIDS (cont)

## HIGH VOLTAGE

**LOSS OF HIGH VOLTAGE**

Check by substitution V19, V20, V21 and V22. Check waveform W18.

| If Satisfactory | If Unsatisfactory |
|---|---|
| Check T3, T5A, T6, T7, R107, R108, C87, C88, C89, C90 and other associated components. | Check L36, C83, C84, R98, R99, R102, R103 and other associated components. |

**INSUFFICIENT HIGH VOLTAGE**

Check by substitution V20, V21 and V23. Check adjustments B2, B3 and B4. Check T3, T5A, R107, R108, R99 and other associated components.

**BLOOMING**

Check by substitution V20, V21, V22 and V23. Check T3, T5A, R113, R108, R107, C90 and other associated components.

## GENERAL

**RASTER, SOUND, NO PICTURE**

Follow procedure outlined under "Loss of Video."

**RASTER, PICTURE, NO SOUND**

Follow procedure outlined under "Weak or no Sound."

**RASTER, NO SOUND, NO PICTURE**

Check by substitution V2, V3, V4, V5, V6, V7, V8 and V9. Check video IF components for failure or change of value. Raster, No Sound, No Picture, UHF, substitute V1.

**NO RASTER, NO SOUND**

Follow procedure outlined under "Dead Set."

**KEYSTONE EFFECT**

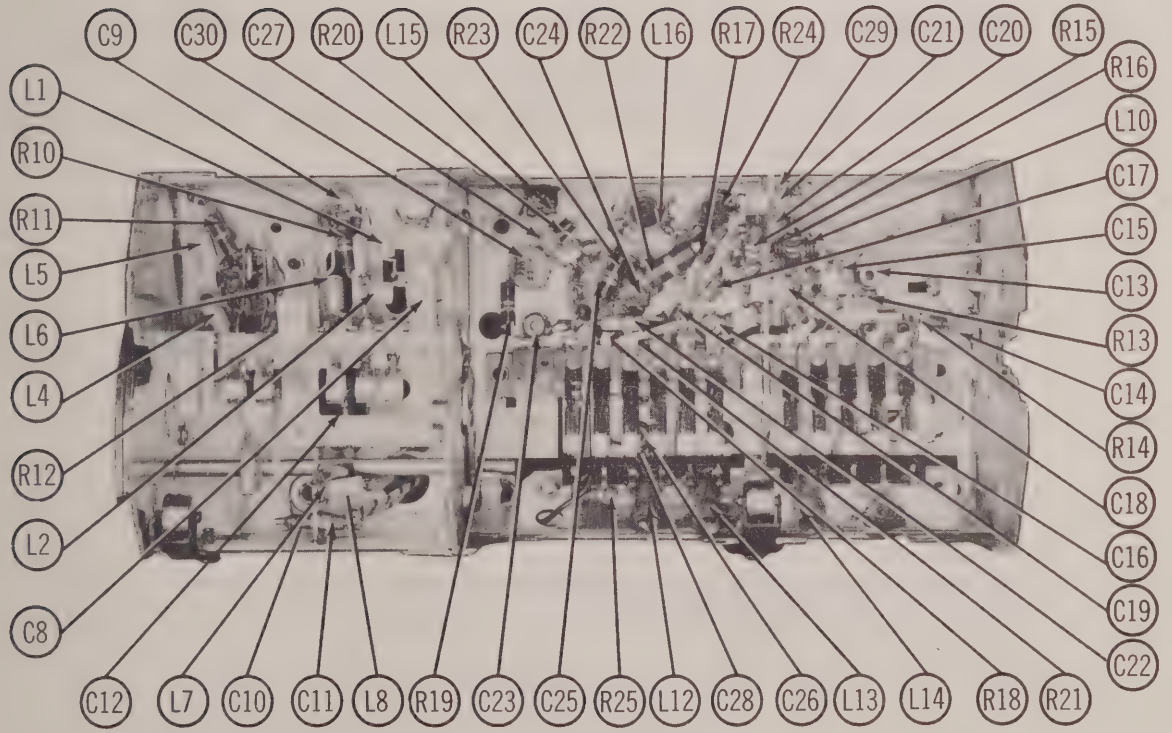
Check T5 and its associated components.

**INTERMITTENT STREAKS**

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.






RF TUNER BOTTOM VIEW

# SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF tuner oscillator circuit may be accomplished as follows:

1. Set the selector knob to VHF position.
2. Tune in a TV station and set the fine tuning control to the center of its range.
3. Remove the channel selector and fine tuning knobs.
4. Adjustments are accessible one at a time thru the small hole above and slightly to the left of the channel switch shaft.

To adjust the UHF oscillator, set the channel selector knobs to the desired UHF channel. The fine tuning lever should be at the center of its range. Remove knobs and adjust the oscillator slug, thru the same hole as for VHF adjustments. If two UHF channels are received and use the same UHF coil strips, the oscillator should be set for the channel closest to the center of the group.

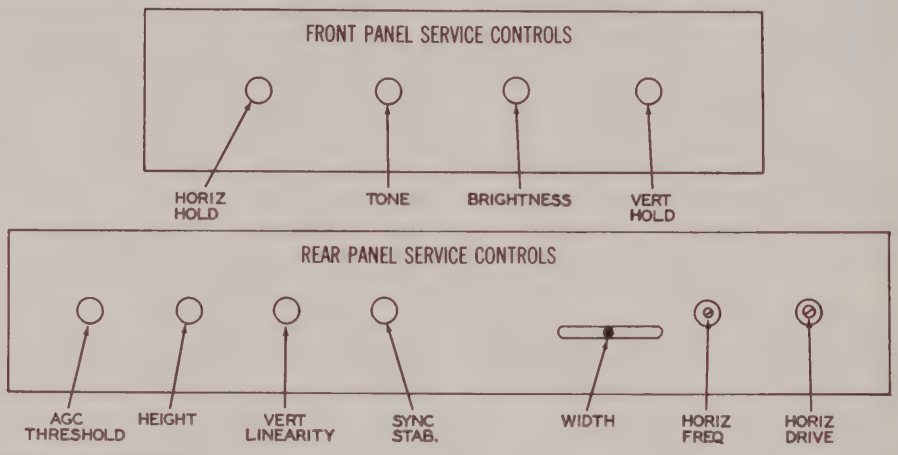
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 5 wood screws holding plastic strip at the top of the safety glass. Remove plastic strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis . (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION




SPECIAL ADJUSTMENTS

AGC THRESHOLD CONTROL

Tune in the strongest TV station available. Turn the AGC threshold control clockwise until a buzz in the sound and a washed out picture appears, then turn the control slightly counter clockwise for clearest picture and best sound.

SYNC STABILITY CONTROL

With the picture locked in slowly turn the sync stability control clockwise until bending occurs at top of picture. Turn control slightly counter clockwise until bending disappears. In general, the weaker the signal area the more clockwise the control should be turned.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control to its mid-range position and adjust the horizontal oscillator coil (L36) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L35) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

# DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs and fine tuning lever from front panel of cabinet.
2. Remove 2 wood screws and 2 metal screws. Remove rear cover.
3. Loosen 4 wood screws. Remove 2 antenna bracket.
4. Remove speaker leads.
5. Remove 5 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.

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BENRUS MODEL
10B01B15B (Ch. 10B)

BENRUS MODEL
10B01B15B (Ch. 10B)

| | |
|---|---|
| TRADE NAME | Benrus Model 10B01B15B (Ch. 10B) |
| SUPPLIER | Benrus Watch Co., Inc., 50 W. 44th St., New York 36, N. Y. |
| TYPE SET | AC Operated AM Superheterodyne Receiver With Electric Clock |
| TUBES (Five) | Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier |
| POWER SUPPLY | 110-120 Volts AC-60 Cycles — RATING .25 Amp. @ 117 Volts AC |
| TUNING RANGE—BROADCAST | 535KC-1620KC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | .02MFD | High side antenna stator lug. Low side to B-. | 455KC (400~ Mod.) | Point of non-interference | Across Voice Coil | A1, A2 A3, A4 | Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation. |
| 2. | | Loop | 1620KC | 1620KC | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | | " | 1400KC | 1400KC | " | A6 | " |

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# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No. | USE | REPLACEMENT DATA | | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| | | BENRUS PART No. | STANDARD REPLACEMENT | | |
| V1 | Conv. | 12BE6 | 12BE6 | 7CH | |
| V2 | IF Amp. | 12BA6 | 12BA6 | 7BK | |
| V3 | Det. -AVC-AF Amp | 12AV6 | 12AV6 | 7BT | |
| V4 | Audio Output | 50C5 | 50C5 | 7CV | |
| V5 | Rect. | 35W4 | 35W4 | 5BQ | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | BENRUS PART No. | MALLORY PART No. | PYRAMID PART No. | SANGAMO PART No. | |
| C1A | 50 | 150 | 25E24-2 | TCD49 | TDL-D50-150 | MTD-1550 | |
| B | 50 | 150 | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | BENRUS PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | |
| C2 | 200 | | ♦23E2022-4 | TCZ-200 | NPO-334-201 | MC237 | |
| C3 | 30 | | | TCZ-30 | NPOL-300 | ZT-5433 | |
| C4 | .047 | 200 | | DF-503 | | PT4147 | |
| C5 | 470 | | | DD-471 | 811-471 | UC-5347 | |
| C6 | 5000 | | | DD-502 | 811-005 | DC525 | |
| C7A | 10000 | | †23E2041-7 | †PC-81 | †1404-02 | | |
| B | 250 | | | | | | |
| C | | | | | | | |
| C8 | 10000 | | | DD-103 | 811-01 | DC511 | |
| C9 | .047 | 400 | | DF-503 | DF-503 | PT4147 | |

♦ Items C3 and R4 are combined in one unit.
† Items C7A, C7B, C7C, R8A and R8B are combined in one unit. When replacing items separately, items C7B and C7C should total 250MFD.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | BENRUS PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | |
| R1A | 500KΩ | ½ | 28E118 | Q13-133 | A47-500K-Z | B-60 | U-48 | Volume |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R1A. |

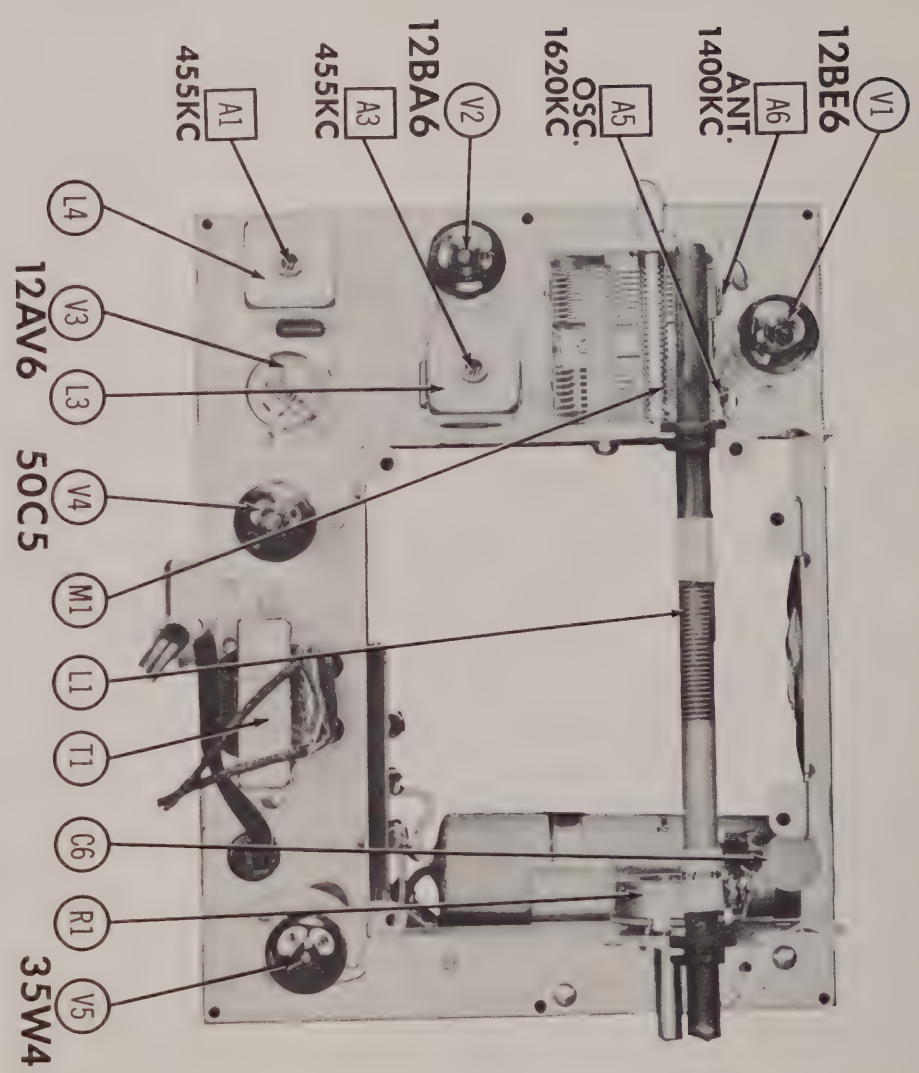
## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|
| | OHMS | WATT | BENRUS PART No. | IRC PART No. | |
| R2 | 47Ω | ½ | 27E470K-½ | BTS-47 | |
| R3 | 1Meg | ½ | 27E105M-½ | BTS-1Meg | |
| R4 | 22KΩ | ½ | ♦23E2022-4 | BTS-22K | |
| R5 | 3.3Meg | ½ | 27E335M-½ | BTS-3.3Meg | |
| R6 | 100Ω | ½ | 27E101K-½ | BTS-100 | |
| R7 | 4.7Meg | ½ | 27E475M-½ | BTS-4.7Meg | |

| ITEM No. | RATING | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|
| | OHMS | WATT | BENRUS PART No. | IRC PART No. | |
| R8A | 250KΩ | ½ | †23E2041-7 | | |
| B | 500KΩ | ½ | | | |
| R9 | 150Ω | ½ | 27E151K-½ | BTS-150 | |
| R10 | 33Ω | ½ | 27E330K-½ | BTS-33 | |
| R11 | 1200Ω | 1 | 27E122K-½ | BTA-1200 | |

♦ Items C3, R4 are combined in one unit.
† Items C7A, C7B, C7C, R8A, R8B are combined in one unit.

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | BENRUS PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2.4KΩ | 3.5Ω | 22E88-2 | Z1101 | A-3025 | A-3332 | 26S58 ① | S-12X | ① Drill one new mounting hole. |

## SPEAKER

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | BENRUS PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3.5Ω | 1E61 | 3A07 | |

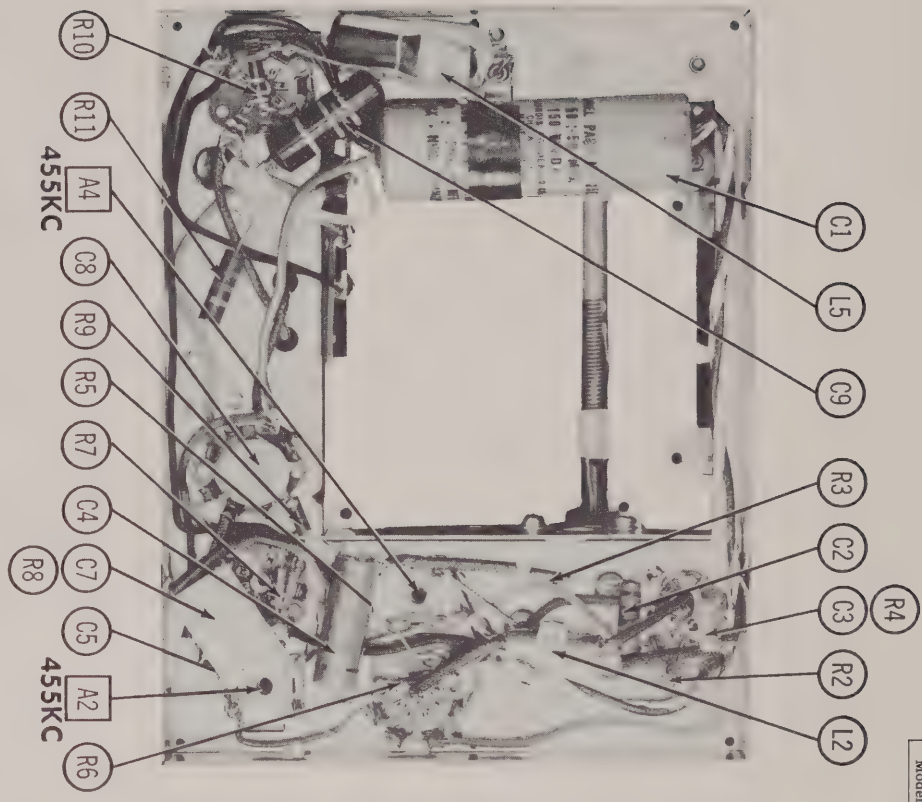
## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | PRI. | SEC. | BENRUS PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | |
| L1 | Ant. Coil | .9Ω | | 64E37-2 | | | | |
| L2 | Osc. Coil | 1.2Ω | 11Ω | 20E990 | 14-1074 | BC-394 | 70-Osc. | |
| L3 | Input IF | 13Ω | 13Ω | 20E732 | 16-6758 | BC-352 | 12-C1 | |
| L4 | Output IF | 14Ω | 14Ω | 20E732 | 16-6758 | BC-353 | 12-C2 | |
| L5 | Chassis Isolation | | | 20E833 | | | | Wound on .1UF Cap. |

## MISCELLANEOUS

| ITEM No. | PART NAME | BENRUS PART No. | NOTES |
|---|---|---|---|
| M1 | Tuning Cap. | 24E66 | 2 Gang (13-240MMF, 13-105MMF) |
| M2 | Clock | 20E991 | Complete with Dial, Hands, etc. |
| | | 61E21 | Clock only |
| | Cabinet | 7E449 | |
| | Knob | 37E97 | Station Indicator |
| | Knob | 37E98 | Volume |
| | Knob | P1028 | Clock (3 used) |
| | Knob | P1029 | Clock-Time Set |
| | Crystal | 9E51 | Clock |

# CHASSIS—BOTTOM VIEW

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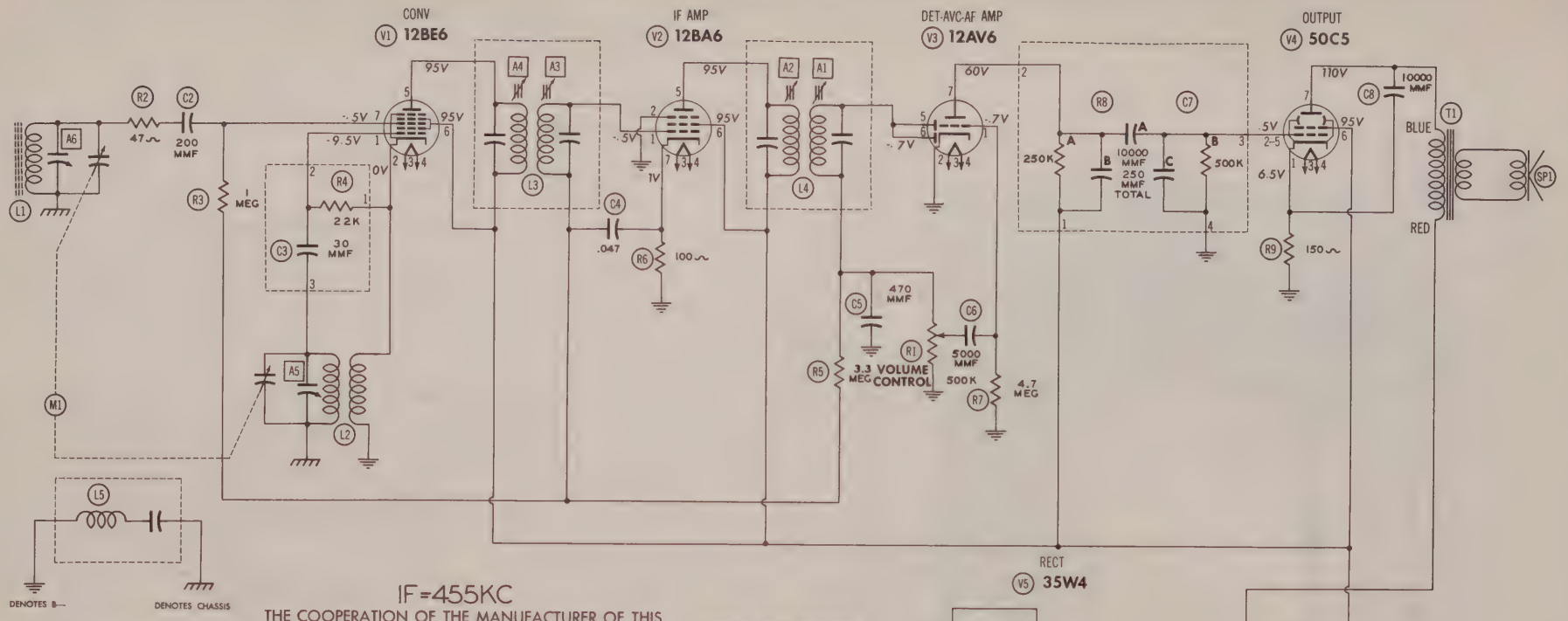
DENVER, COLORADO





BENRUS
Model 10B01B15B (Ch. 10B)




IF=455KC

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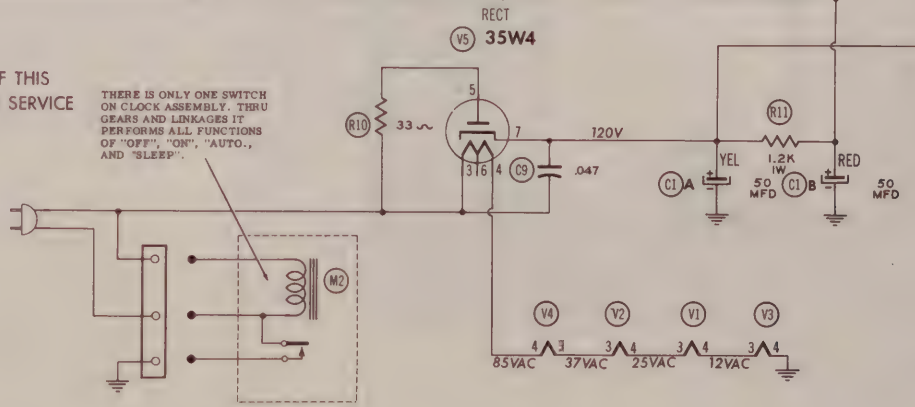


RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V 1 | 12BE6 | 22KΩ | 1Ω | 26Ω | 13Ω | †1.2KΩ | †1.2KΩ | 4.8Meg |
| V 2 | 12BA6 | 3.8Meg | 0Ω | 39Ω | 26Ω | †1.2KΩ | †1.2KΩ | 100Ω |
| V 3 | 12AV6 | 4.7Meg | 0Ω | 13Ω | 0Ω | 500KΩ | 500KΩ | †25KΩ |
| V 4 | 50C5 | 150Ω | 500KΩ | 39Ω | 89Ω | 500KΩ | †1.2KΩ | †220Ω |
| V 5 | 35W4 | TP | NC | 124Ω | 89Ω | 157Ω | 96Ω | 60KΩ |

ALL MEASUREMENTS WITH CLOCK DISCONNECTED.
†MEASURED FROM PIN 7 OF V5.
TP-TIE POINT.
NC-NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

RETMA MEMBER

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MODEL 1114F

**EMERSON MODELS 1102D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D, 1143D (Ch. 120245-D, -N, 120255-D, -F, -H, 120256-D, -F, -H, -N, 120259-D, -F, -H, -N, 120269-L, 120273-F, 120275-L, 120276-L & Radio Ch. 120272-B)**

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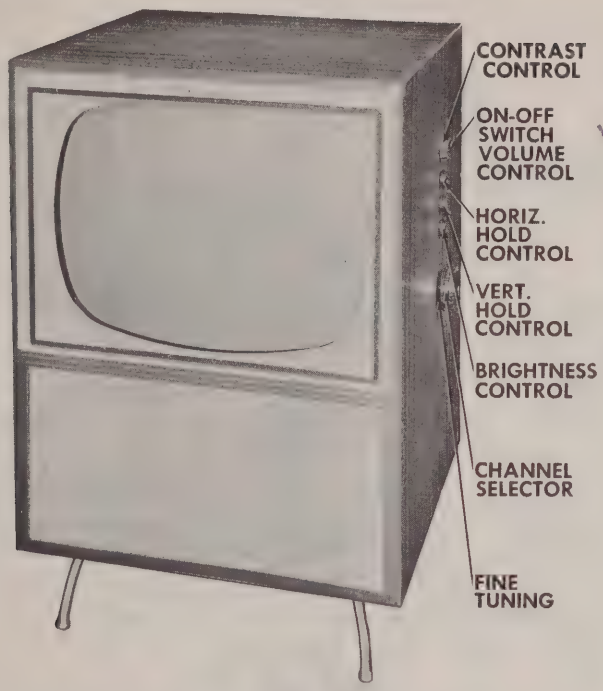
DATE 12–55 SET 299 FOLDER 4

# EMERSON MODELS 1102D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D, 1143D (Ch. 120245-D, -N, 120255-D, -F, -H, 120256-D, -F, -H, -N, 120259-D, -F, -H, -N, 120269-L, 120273-F, 120275-L, 120276-L & Radio Ch. 120272-B)

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EMERSON MODEL 1114F

| TRADE NAME | Emerson | MODELS | CHASSIS | TUNERS |
|---|---|---|---|---|
| | | 1102D, 1130D | 120245-D | 470786 |
| | | 1102F, 1130F | 120245-N | 470818 |
| | | 1106H, 1106J | 120255-D | 470803 |
| | | 1106L, 1106N | 120255-F | 470798 |
| | | 1106P, 1106R | 120255-H | 470809 |
| | | 1104F | 120256-D | 470803 |
| | | 1104J, 1132F | 120256-F | 470798 |
| | | 1104H | 120256-H | 470809 |
| | | 1104L | 120256-N | 470817 |
| | | 1114D | 120259-D | 470803 |
| | | 1114F, 1142D | 120259-F | 470798 |
| | | 1114L | 120259-H | 470809 |
| | | 1114H | 120259-N | 470817 |
| | | 1128F | 120273-F (TV)<br>120272-B (Radio) | 470798 |
| | | 1107D, 1107F | 120269-L | 470810 |
| | | 1105D | 120275-L | 470810 |
| | | 1143D, 1115D | 120276-L | 470810 |

MANUFACTURER Emerson Radio & Phonograph Corp., 14th. & Coles Sts., Jersey City 2, N.J.
TYPE SET Television Receiver
TUBES Sixteen
POWER SUPPLY 110-120 Volts AC-60 Cycles RATING 1.14 Amp. @ 117 Volts AC
TUNING RANGE Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

## INDEX

Alignment Instructions ..... 5 thru 8
Disassembly Instructions ..... 22
Horizontal Sweep Circuit Adjustments ..... 13
Parts List and Descriptions ..... 16, 17, 18
Photographs
Cabinet-Rear View ..... 13
Capacitor Identification ..... 4, 9
Chassis-Top View ..... 3
Control Panel Sub-Chassis ..... 22
RF Tuner ..... 5
Resistor Identification ..... 23, 24
Photographs (Cont)
Trans., Inductor & Alignment Identification ..... 3
Production Changes ..... 21
Resistance Measurements ..... 11
Servicing in the Field ..... 22
Schematic (Alternate Tuners) ..... 14, 19, 20
Schematic (Radio) ..... 15
Schematic (TV) ..... 2
Trouble Shooting Aids ..... 12, 21
Tube Failure Check Chart ..... 10
Tube Placement Chart (Bottom View) ..... 11
Tube Placement Chart (Top View) ..... 10

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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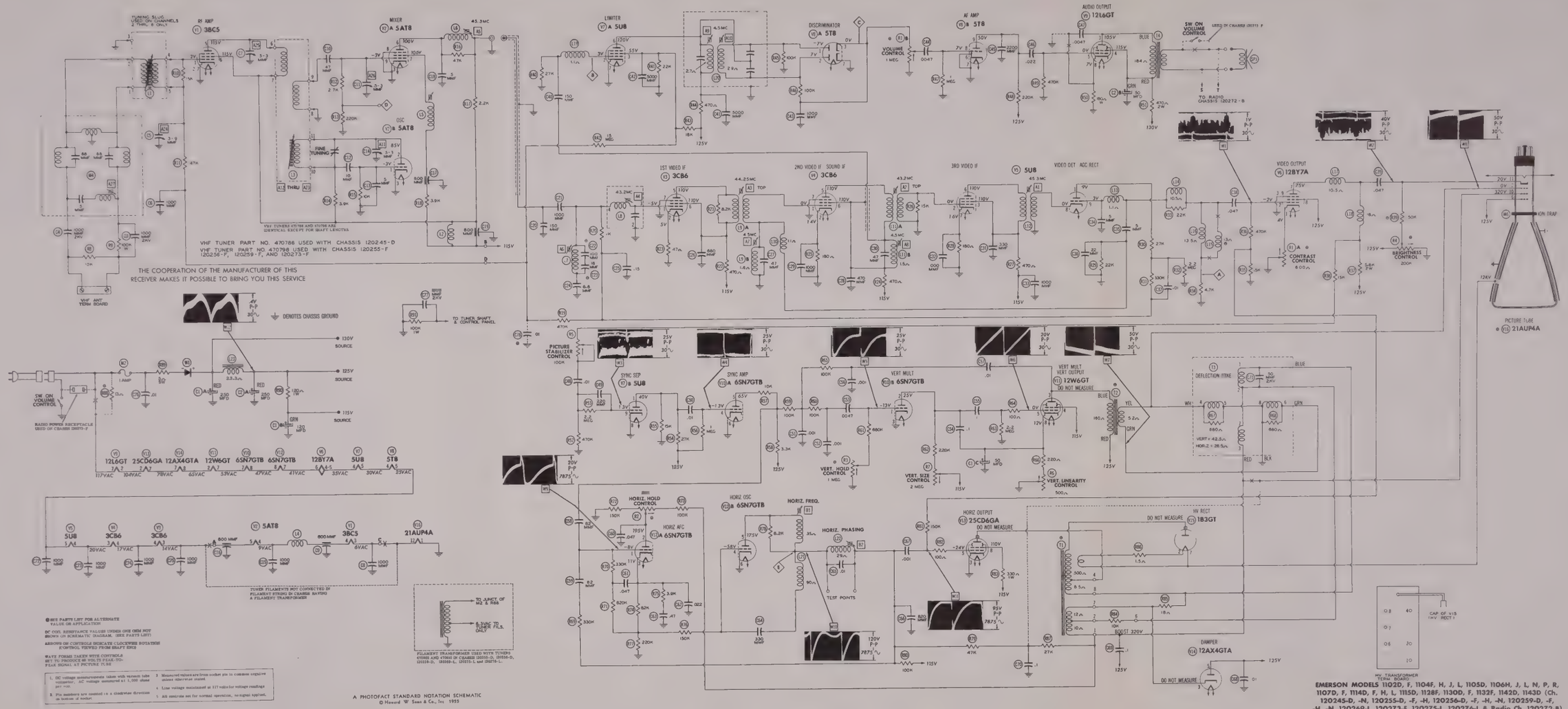
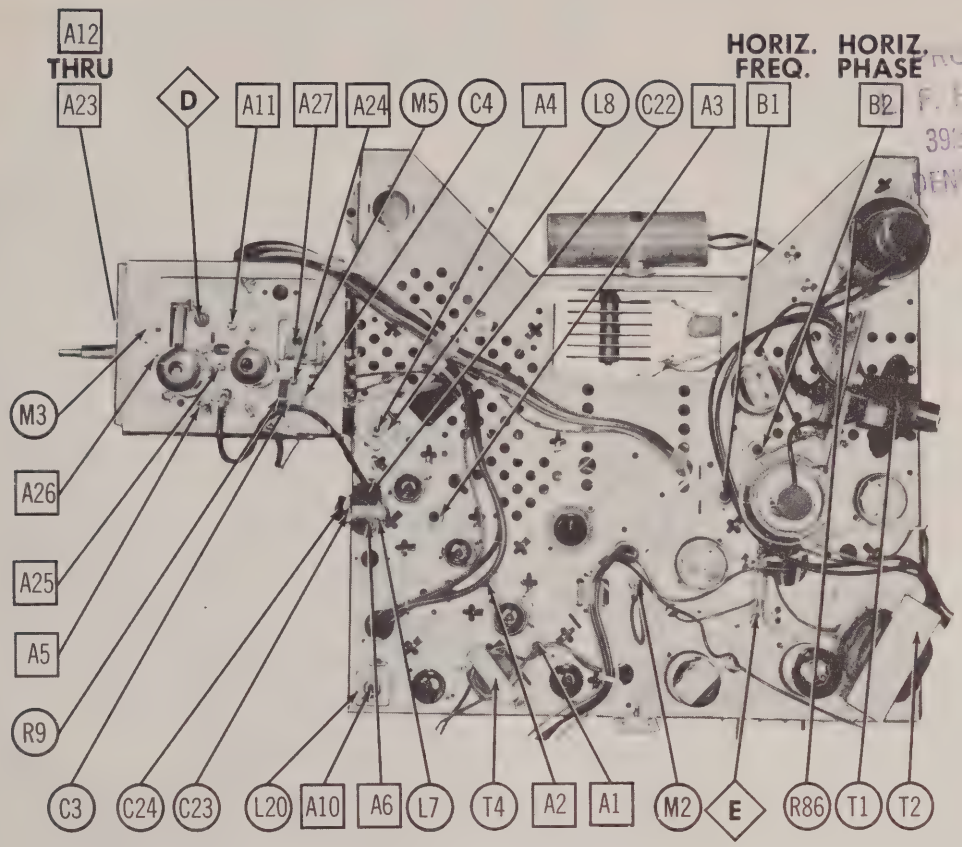
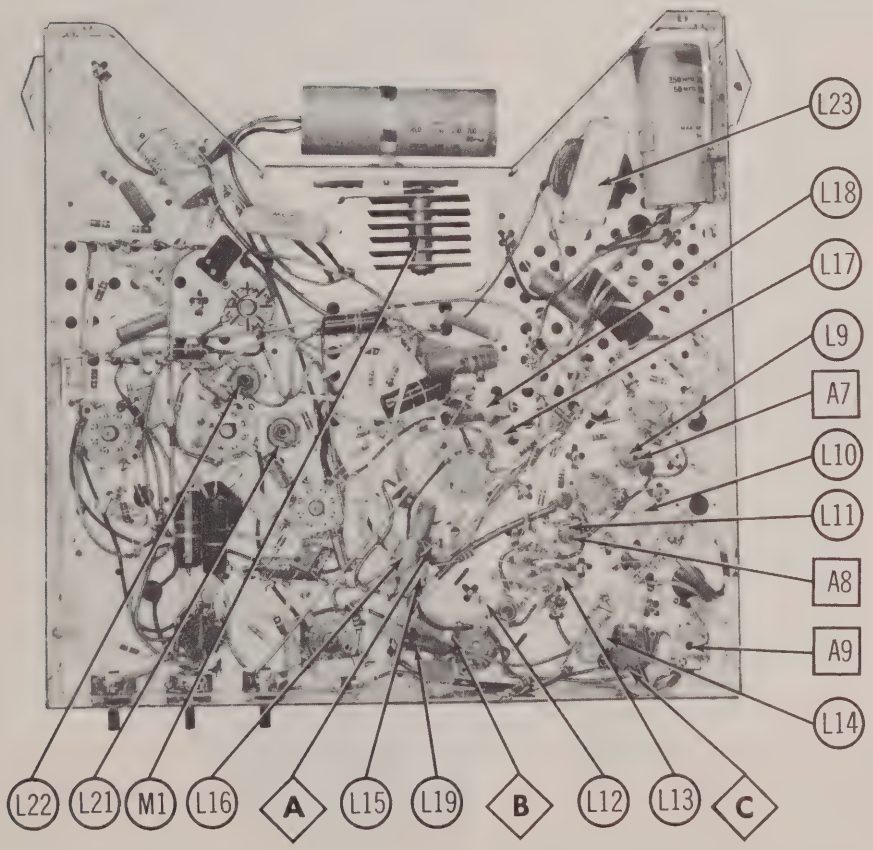

VHF TUNER PART NO. 470788 USED WITH CHASSIS 120245-D
VHF TUNER PART NO 470798 USED WITH CHASSIS 120255-F
120256-F, 120259-F, AND 120273-F
THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES CHASSIS GROUND
12L6GT 25CD6GA 12AX4GTA 12W6GT 6SN7GTB 6SN7GTB 12BY7A 5U8 5T8
5U8 3CB6 3CB6 5AT8 3BC5 21AUP4A
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1955




CHASSIS TOP VIEW




CHASSIS BOTTOM VIEW INDUCTOR AND ALIGNMENT IDENTIFICATION

F. B... 3921 ... ST.
DENVER, COLORADO

## CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

EMERSON MODELS 1102D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D, 1143D (Ch. 120245-D, -N, 120255-D, -F, -H, 120256-D, -F, -H, -N, 120259-D, -F, -H, -N, 120269-L, 120273-F, 120273-L, 120276-L & Radio Ch. 120272-B).

# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from chassis.

## VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C25. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | Direct | High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis. | Not used | 45.3MC (Unmod.) | 12 | Use VTVM DC probe to point Ⓐ. Common to chassis. | A1, A5 | Attenuate generator output for not more than 2 volts at VTVM. Adjust for maximum deflection. |
| 2. | " | " | " | 43.2MC | " | " | A2, A4 | " |
| 3. | " | " | " | 44.25MC | " | " | A3 | Adjust for maximum deflection. Repeat steps 1 thru 3 until maximum deflection on VTVM is obtained. |
| 4. | " | " | " | 47.25MC (400∿ Mod.) | " | Vert. Amp. thru 10KΩ to point Ⓐ. Common to chassis. | A6 | Adjust for MINIMUM 400∿ indication on scope. Use high scope gain and increase generator output. |
| 5. | " | " | 44MC (10MC Swp.) | 41.25MC 45.75MC 47.25MC | " | " | | Use only enough sweep generator output for useable pattern on scope. Check for response curve similar to Fig. 1. If necessary, slightly retouch A1 thru A5 to obtain desired response. If video marker (45.75MC) is too high readjust A5. If too low, readjust A3. |

## SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 6. | .01MFD | High side to pin 9 (grid) of 5U8 (V5A). Low side to chassis. | 4.5MC (Unmod) | Any non-interfering channel | DC probe thru 10KΩ to point Ⓑ. Common to chassis. | A7, A8 | Adjust for maximum deflection. |
| 7. | " | " | " | " | DC probe thru 10KΩ to point Ⓒ. Common to chassis. | A9, A10 | Detune A10 for maximum negative deflection. Adjust A9 for maximum deflection. Readjust A10 for zero reading on VTVM. A positive and negative reading will be obtained on either side of the correct setting. |

## SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 6. | .01MFD | High side to pin 9 (grid) of 5U8 (V5A). Low side to chassis. | 4.5MC (450KC Swp.) | 4.5MC | Any non-interfering channel | Vert. Amp. thru 10KΩ to point Ⓑ. Low side to chassis. | A7, A8 | Adjust for curve of maximum amplitude and symmetry similar to Fig. 2. |
| 7. | " | " | " | " | " | Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis. | A9, A10 | Adjust A9 for maximum amplitude and straightness of crossover lines as in Fig. 3. Adjust A10 so that 4.5MC occurs at center of crossover lines. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines. |

## OSCILLATOR ALIGNMENT FOR TUNERS 470786, 470798, 470803, 470817 AND 470818

Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be necessary to correct them in one step using A-11. It should be noted that this is an all channel oscillator adjustment and should not be used to correct any one channel. If A-11 will not bring in all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency.
The channel oscillator adjustment screws are reached through a hole just to the left and above the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel selector is turned to each channel. Replace shield over converter tube. Connect bias as under "Video IF Alignment". Note: Adjustment A-11 is not in tuners 470817 and 470818.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 8. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 207MC (10MC Swp) | 205.25MC 209.75MC | 12 | Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis. | A12 | Advance gain so that the sound notch is visible on response curve. Adjust to place sound marker in trap notch. Video marker should fall at 30 to 40% response on opposite slope of response curve as in Fig. 4. |
| | | | 213MC (10MC Swp) | 211.25MC 215.75MC | 13 | | A13 | |
| | | | 201MC (10MC Swp) | 199.25MC 203.75MC | 11 | | A14 | |
| | | | 195MC (10MC Swp) | 193.25MC 197.75MC | 10 | | A15 | |
| | | | 189MC (10MC Swp) | 187.25MC 191.75MC | 9 | | A14 | |
| | | | 183MC (10MC Swp) | 181.25MC 185.75MC | 8 | | A17 | |
| | | | 177MC (10MC Swp) | 175.25MC 179.75MC | 7 | | A18 | |
| | | | 85MC (10MC Swp) | 83.25MC 87.75MC | 6 | | A19 | |
| | | | 79MC (10MC Swp) | 77.25MC 81.75MC | 5 | | A20 | |
| | | | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | | A21 | |
| | | | 63MC (10MC Swp) | 61.25MC 65.75MC | 3 | | A22 | |
| | | | 57MC (10MC Swp) | 55.25MC 59.75MC | 2 | | A23 | |

EMERSON MODELS 1102D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D, 1143D (Ch. 120245-D, -N, 120255-D, -F, -H, 120256-D, -F, -H, -N, 120259-D, -F, -H, -N, 120269-L, 120273-F, 120275-L, 120276-L & Radio Ch. 120272-B)

# ALIGNMENT INSTRUCTIONS (cont)

### RF AND MIXER ALIGNMENT FOR TUNERS 470786, 470798, 470803, 470817 AND 470818

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 9. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 207MC (10MC Swp.) | 205.25MC 209.75MC | 12 | Vert. Amp. thru 10KΩ to point Ⓓ. Low side to chassis. | A24, A25, A26 | Adjust marker generator to provide a readable marker. Be sure it does not distort the response curve. Adjust for response similar to Fig. 5. |
| 10. | " | " | 213MC (10MC Swp.) | 211.25MC 215.75MC | 13 | " | | Check for response similar to Fig. 5 on all channels. If markers fall below 70% on any channel, make compromise adjustments of A24, A25 and A26 with channel switch set to that channel. |
| | | | 201MC (10MC Swp.) | 199.25MC 203.75MC | 11 | | | |
| | | | 195MC (10MC Swp.) | 193.25MC 197.75MC | 10 | | | |
| | | | 189MC (10MC Swp.) | 187.25MC 191.75MC | 9 | | | |
| | | | 183MC (10MC Swp.) | 181.25MC 185.75MC | 8 | | | |
| | | | 177MC (10MC Swp.) | 175.25MC 179.75MC | 7 | | | |
| | | | 85MC (10MC Swp.) | 83.25MC 87.75MC | 6 | | | |
| | | | 78MC (10MC Swp.) | 77.25MC 81.75MC | 5 | | | |
| | | | 69MC (10MC Swp.) | 67.25MC 71.75MC | 4 | | | |
| | | | 63MC (10MC Swp.) | 61.25MC 65.75MC | 3 | | | |
| | | | 57MC (10MC Swp.) | 55.25MC 59.75MC | 2 | | | |

### IF TRAP ADJUSTMENT FOR VHF TUNERS 470786, 470798, 470803, 470809, 470817 AND 470818

The IF wave trap should be tuned to minimize interference caused by signals which fall within the video IF bandpass (40-48MC). Tune in a station on which the interference is noted and adjust A27 for minimum interference in the picture.

### OSCILLATOR ADJUSTMENT FOR TUNER 470809 USING A TV SIGNAL

Set the fine tuning control to the center of its range. Set adjustment A28 so that the screw head is approximately 5/16" from its mounting plate.
Set the channel selector switch to the highest high band channel (7-13) station operating in that area. Adjust A29 for best picture and clearest sound. Set channel selector to next lowest channel (12 to 2) being received in that area and adjust oscillator slug for that channel. For best picture and sound. The channel strip adjustment screws are reached thru a hole just to the right of the channel switch shaft.
The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.

### OSCILLATOR ALIGNMENT FOR TUNER 470809 USING SWEEP GENERATOR AND OSCILLOSCOPE

Attenuate sweep generator output for a reading of not more than -1 volt on VTVM at point Ⓐ.
Set adjustment A28 so that the screw head is approximately 5/16" from its mounting plate.
Connect bias as under "Video IF Alignment".
The channel strip adjustment screws for channels 12 thru 2 (A30 thru A40) are reached through a hole just to the right of the channel switch shaft.
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 11. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 213MC (10MC Swp) | 211.25MC 215.75MC | 13 | Vert. Amp. thru 10KΩ to point Ⓓ. Low side to chassis. | A29 | If a separate marker generator is used, couple it loosely to antenna terminals. Advance gain so that the sound notch is visible on response curve. Adjust to place sound marker in trap notch. Video marker should fall at 30 to 40% response on opposite slope of response curve as in Fig. 4. |
| | | | 207MC (10MC Swp) | 205.25MC 209.75MC | 12 | | A30 | |
| | | | 201MC (10MC Swp) | 199.25MC 203.75MC | 11 | | A31 | |
| | | | 195MC (10MC Swp) | 193.25MC 197.75MC | 10 | | A32 | |
| | | | 189MC (10MC Swp) | 187.25MC 191.75MC | 9 | | A33 | |
| | | | 183MC (10MC Swp) | 181.25MC 185.75MC | 8 | | A34 | |
| | | | 177MC (10MC Swp) | 175.25MC 179.75MC | 7 | | A35 | |
| | | | 85MC (10MC Swp) | 83.25MC 87.75MC | 6 | | A36 | |
| | | | 79MC (10MC Swp) | 77.25MC 81.75MC | 5 | | A37 | |
| | | | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | | A38 | |
| | | | 63MC (10MC Swp) | 61.25MC 65.75MC | 3 | | A39 | |
| | | | 57MC (10MC Swp) | 55.25MC 59.75MC | 2 | | A40 | |

### RF AND MIXER ALIGNMENT FOR TUNER 479809

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 12. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 213MC (10MC Swp) | 211.25MC 215.75MC | 13 | Vert. Amp. thru 10KΩ to point Ⓓ. Low side to chassis. | A41, A42, A43, A44 | Adjust marker generator to provide a readable marker, be sure marker does not distort response curve. Adjust for response similar to Fig. 5. |
| 13. | " | " | 177MC (10MC Swp) | 175.25MC 179.75MC | 7 | " | A45, A46 | Adjust for response curve similar to Fig. 5. Repeat step 12 and then repeat step 13 until no changes are noted. |
| 14. | " | " | 85MC (10MC Swp) | 83.25MC 87.75MC | 6 | " | A47, A48, A49 | Adjust for response curve similar to Fig. 5. |
| 15. | " | " | 79MC (10MC Swp) | 77.25MC 81.75MC | 5 | " | A50, A51, A52 | Check for response curve similar to Fig. 5. If necessary adjust by compressing or expanding coil turns for desired response. |
| 16. | " | " | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | " | A53, A54, A55 | " |
| 17. | " | " | 63MC (10MC Swp) | 61.25MC 65.75MC | 3 | " | A56, A57, A58 | " |
| 18. | " | " | 57MC (10MC Swp) | 55.25MC 59.75MC | 2 | " | A59, A60, A61 | " |

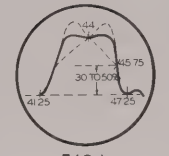


FIG. 1

FIG. 2

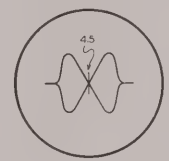


FIG. 3

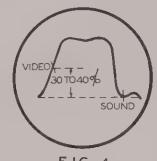


FIG. 4

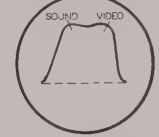


FIG. 5

### VHF OSCILLATOR ADJUSTMENT FOR TUNER 470810 USING A TV SIGNAL

Set the fine tuning control to the center of its range. This is indicated by the flat part of shaft facing top of the tuner.
Set the channel selector switch to highest high band channel (7-13) station operating in that area. Adjust the high band oscillator adjustment (A29 for best picture and sound. Check all other channels between 7 and 13 received in that area. If unable to obtain beat picture and sound by adjusting the fine tuning control, make compromise adjustment of A29 for all high band channels.
Set the channel selector switch to the highest low band channel (2-6) in that area. Set the fine tuning control to the center of its range. Adjust (A36) for best picture and sound. Check all other low band channels in that area. If unable to obtain best picture and sound by adjusting the fine-tuning control, make compromise adjustment of A36 for all low band channels.

### VHF OSCILLATOR ALIGNMENT FOR TUNER 470810 USING SWEEP GENERATOR AND OSCILLOSCOPE

Attenuate sweep generator output for a reading of not more than -1 volt on VTVM at point Ⓐ.
Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 19. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 213MC (10MC Swp) | 211.25MC 215.75MC | 13 | Vert. Amp. thru 10KΩ to point Ⓓ. Low side to chassis. | A29 | If a separate marker generator is used couple it loosely to antenna terminals. Advance gain so that the sound trap notch is visible on response curve. Adjust to place sound marker in trap notch. Video marker should fall at 30 to 40% response on opposite slope of response curve as in Fig. 4. |
| | | | 207MC (10MC Swp) | 205.25MC 209.75MC | 12 | | A30 | |
| | | | 201MC (10MC Swp) | 199.25MC 203.75MC | 11 | | A31 | |
| | | | 195MC (10MC Swp) | 193.25MC 197.75MC | 10 | | A32 | |
| | | | 189MC (10MC Swp) | 187.25MC 191.75MC | 9 | | A33 | |
| | | | 183MC (10MC Swp) | 181.25MC 185.75MC | 8 | | A34 | |
| | | | 177MC (10MC Swp) | 175.25MC 179.75MC | 7 | | A35 | |
| | | | 85MC (10MC Swp) | 83.25MC 87.75MC | 6 | | A36 | |
| | | | 79MC (10MC Swp) | 77.25MC 81.75MC | 5 | | A37 | |
| | | | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | | A38 | |
| | | | 63MC (10MC Swp) | 61.25MC 65.75MC | 3 | | A39 | |
| | | | 57MC (10MC Swp) | 55.25MC 59.75MC | 2 | | A40 | |

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### VHF RF AND MIXER ALIGNMENT FOR TUNER 470810

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 20. | Two 120Ω Carbon Resistors | Across VHF antenna terminals with 120Ω in each lead. | 213MC (10MC Swp) | 211.25MC 215.75MC | 13 | Vert. Amp. thru 10KΩ to point Ⓓ. Low side to chassis. | A62, A63, A64 | Adjust A62, A63 and A64 for response curve similar to Fig. 5. A64 is adjusted by compressing or expanding coil turns and affects mid-band gain. |
| 21. | " | " | 207MC (10MC Swp) | 205.25MC 209.75MC | 12 | " | A65, A66, A67 | Adjust by expanding or compressing coil turns for response curve similar to Fig. 5. |
| 22. | " | " | 201MC (10MC Swp) | 199.25MC 203.75MC | 11 | " | A68, A69, A70 | " |
| 23. | " | " | 195MC (10MC Swp) | 193.25MC 197.75MC | 10 | " | A71, A72, A73 | " |
| 24. | " | " | 189MC (10MC Swp) | 187.25MC 191.75MC | 9 | " | A74, A75, A76 | " |
| 25. | " | " | 183MC (10MC Swp) | 181.25MC 185.75MC | 8 | " | A77, A78, A79 | " |
| 26. | " | " | 177MC (10MC Swp) | 175.25MC 179.75MC | 7 | " | A80, A81, A82 | " |
| 27. | " | " | 85MC (10MC Swp) | 83.25MC 87.75MC | 6 | " | A83, A84, A85 | " |
| 28. | " | " | 79MC (10MC Swp) | 77.25MC 81.75MC | 5 | " | A86, A87, A88 | " |
| 29. | " | " | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | " | A89, A90, A91 | " |
| 30. | " | " | 63MC (10MC Swp) | 61.25MC 65.75MC | 3 | " | A92, A93, A94 | " |
| 31. | " | " | 57MC (10MC Swp) | 55.25MC 59.75MC | 2 | " | A95, A96, A97 | " |

### UHF IF ALIGNMENT FOR TUNER 470810

Connect bias as under "Video IF Alignment".
Set channel selector switch to UHF position.
Remove the UHF plug in section from socket at VHF tuner.
Connect a 56Ω carbon resistor across sweep generator output.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 32. | 270Ω Carbon Resistor | High side thru 270Ω resistor to pin 1 of VHF socket on VHF tuner. Low side to chassis. | 44MC (10MC Swp) | 41.25MC 45.75MC | UHF position | Vert. Amp. thru 10KΩ to point Ⓓ. Low side to chassis. | A98, A99, A100 | Adjust A98, A99 and A100 for response curve similar to Fig. 5 with 41.25MC (sound) and 45.75MC (video) markers above 90% on response curve. Replace UHF plug in section in socket to VHF tuner. |

EMERSON MODELS 110 2D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D, 1143D (Ch. 120245-D, -N, 120255-D, -F, -H), 120256-D, -F, -H), -N, 120259-D, -F, -H), -N, 120269-L, 120273-F, 120275-L, 120276-L & Radio Ch. 120272-B)

# ALIGNMENT INSTRUCTIONS (cont)

UHF OSCILLATOR ALIGNMENT TUNER 470810

Connect bias as under "Video IF Alignment".
Set channel selector to UHF position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 33. | Two 120Ω Carbon Resistors | Across UHF antenna terminals with 120Ω resistor in each lead. | 473MC (10MC Swp) | 476MC | 14 (fully clockwise) | Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis. | A101 | Adjust gain so that the sound notch is visible on response curve. Adjust to place sound marker in trap notch as in Fig. 4. |
| 34. | " | " | 887MC (10MC Swp) | 890MC | 83 (fully counter clockwise) | " | A102 | " |

UHF PRESELECTOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Set the UHF tuner shaft fully counter clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 35. | Two 120Ω Carbon Resistors | Across UHF antenna terminal with 120Ω in each lead. | 887MC (10MC Swp) | 890MC | Fully counter clockwise | Vert. Amp. to point Ⓓ. Low side to chassis. | A103, A104 | Do not remove tuner shield. Adjust A103 and A104 by bending tabs in or out for response curve similar to Fig. 5. |

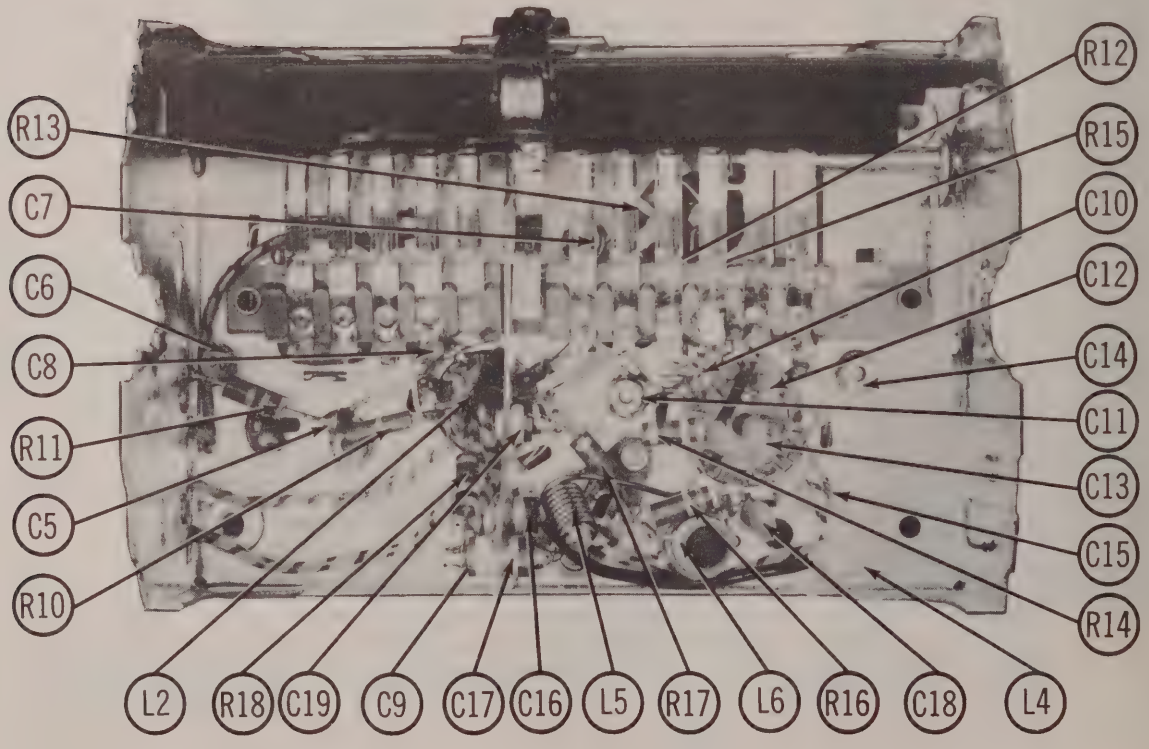
IF TRAP ADJUSTMENTS FOR UHF-VHF TUNER 470810

The IF wave traps (A105 and A106) should be tuned to minimize interference caused by signals which fall within the video IF bandpass (40-48MC). Tune in a TV station on which the interference is noted and adjust A105 and A106 for minimum interference in the picture. If no interference is noted set adjustment A105 and A106 fully clockwise.

RADIO ALIGNMENT

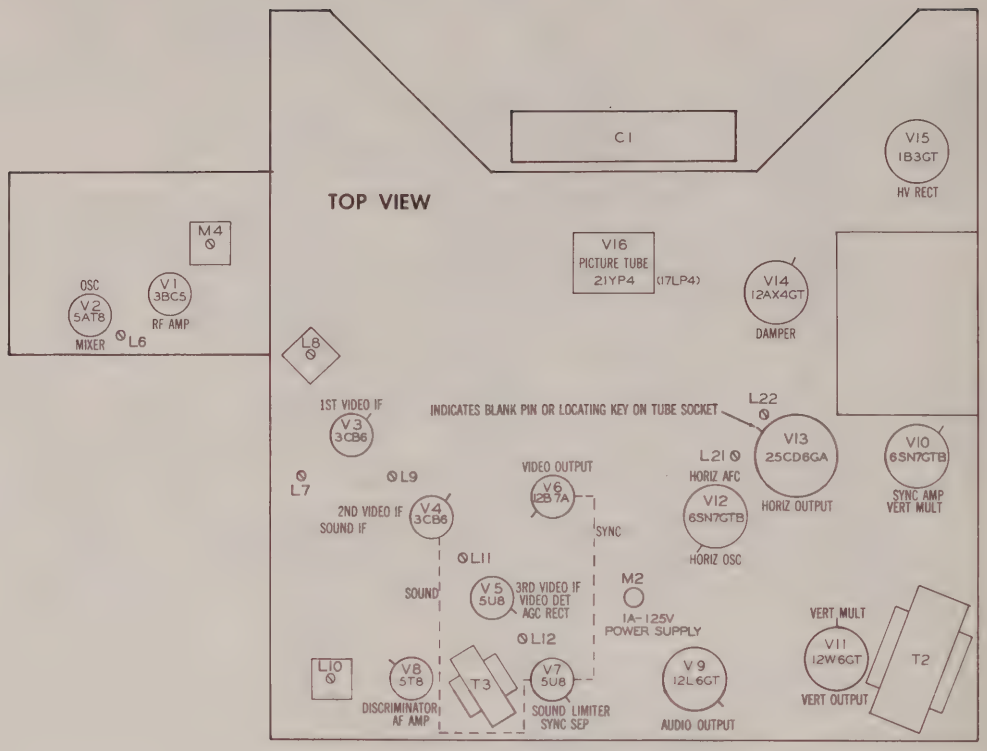
Use isolation transformer if available. If not, connect a .25MFD capacitor in series with the low side of signal generator and B-. Volume control should be at maximum position.
Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated screw driver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 36. | .005MFD Capacitor | High side to grid (pin 7) of converter tube (12BE6). Low side to chassis. | 455KC | Radio | Tuning gang fully open | Across voice coil | A107, A108, A109, A110 | Adjust for maximum deflection. |
| 37. | | Loop (see remarks) | 1620KC | " | " | " | A111 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 38. | " | " | 1400KC | " | Tune to 1400KC signal | " | A112 | " |




RF TUNER BOTTOM VIEW

# TUBE PLACEMENT CHART




# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

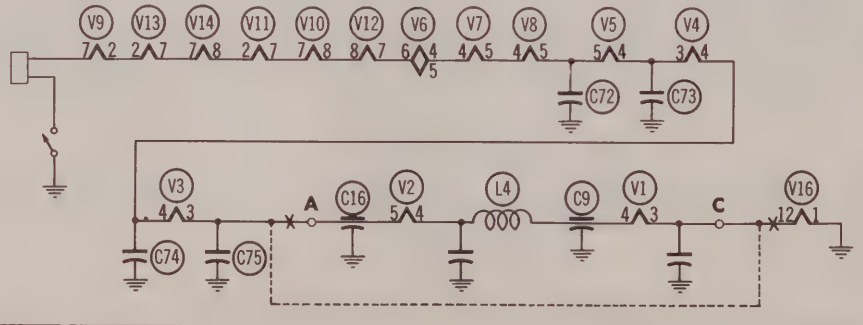
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifier (M1), Fuse (M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V5, V6, V16**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V10, V11**
No horiz. sync - **V10, V12**
No vert. or horiz. sync - **V7, V10**

SWEEP FAILURE
No raster, has sound - **V12, V13, V14, V15, V16**
No vertical deflection - **V10, V11**
Poor vert. linearity or foldover - **V10, V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, V15, M1**
Vert. off freq. - **V10, V11**
Horiz. off freq. - **V10, V12**

**NOTE: Since this receiver employs tubes used in series filament network, an open filament in any tube in series may cause the set to be inoperative (See circuit below).**

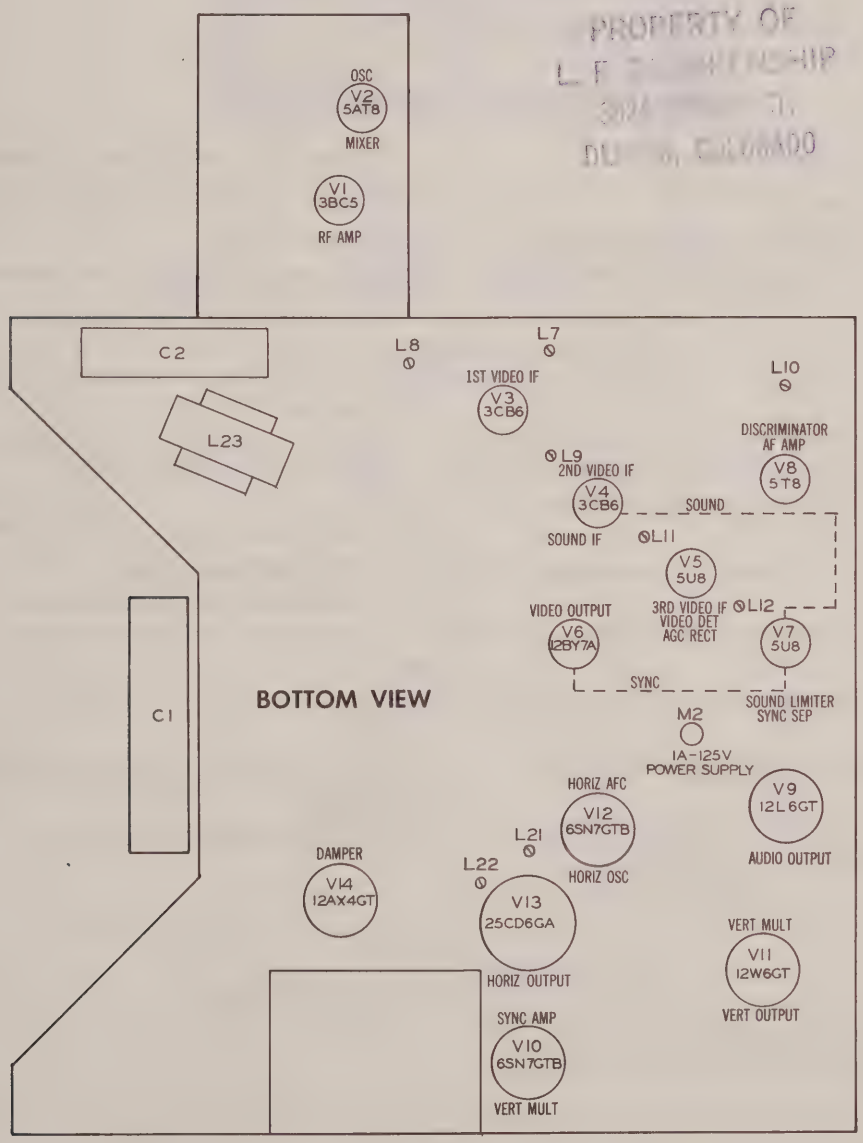


# RESISTANCE MEASUREMENTS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 3BC5 | 2. 5Meg | 0Ω | 2Ω | 3Ω | †145Ω | †145Ω | 0Ω | | |
| V 2 | 5AT8 | 10KΩ | †4KΩ | 0Ω | 3Ω | 4Ω | †2. 3KΩ | †4KΩ | 0Ω | 225KΩ |
| V 3 | 3CB6 | 2Meg | 47Ω | 4Ω | 5Ω | †600Ω | †600Ω | 0Ω | | |
| V 4 | 3CB6 | 1. 6Ω | 180Ω | 6Ω | 5Ω | †600Ω | †600Ω | 0Ω | | |
| V 5 | 5U8 | 2Meg | 0Ω | †600Ω | 6Ω | 7Ω | †600Ω | 180Ω | 0Ω | 4. 7KΩ |
| V 6 | 12BY7A | 360Ω | 500KΩ | 0Ω | 9Ω | 9Ω | 10Ω | †5. 6KΩ | †23Ω | 0Ω |
| V 7 | 5U8 | †17KΩ | 27KΩ | †13KΩ | 9Ω | 8Ω | †500Ω | 0Ω | 0Ω | 2. 7Meg |
| V 8 | 5T8 | 100KΩ | 100KΩ | 200KΩ | 8Ω | 7Ω | 0Ω | 0Ω | 1Meg | †220KΩ |
| V 9 | 12L6GT | TP | 25Ω | †700Ω | †470Ω | 470KΩ | TP | 28Ω | 180Ω | |
| V 10 | 6SN7GTB | 1Meg | †900KΩ | 0Ω | 1Meg | †13KΩ | 0Ω | 14Ω | 12Ω | |
| V 11 | 12W6GT | TP | 17Ω | †200Ω | †145Ω | 2. 2Meg | TP | 14Ω | 450Ω | |
| V 12 | 6SN7GTB | 1. 4Meg | ▲80KΩ | 300KΩ | 400KΩ | ▲70KΩ | 0Ω | 10Ω | 12Ω | |
| V 13 | 25CD6GA | NC | 25Ω | 0Ω | TP | 170KΩ | TP | 20Ω | †500Ω | TOP CAP ▲9Ω |
| V 14 | 12AX4GTA | NC | NC | 130KΩ | NC | †23Ω | NC | 20Ω | 17Ω | |
| V 15 | 1B3GT | | PINS | 1-8 | HAVE | INF | RESISTANCE | | | TOP CAP ▲526Ω |
| V 16 | 21AUP4A | 0Ω | 12Ω | PIN 6 †23Ω | PIN 10 ▲12Ω | PIN 11 †180KΩ | PIN 12 2Ω | | | |

†MEASURED FROM OUTPUT OF M1.
▲MEASURED FROM PIN 3 OF V14.
NC-NO CONNECTION.
TP-TIE POINT.

PROPERTY OF
L F [illegible]SHIP
[illegible]
DU[illegible], COLORADO




# TUBE PLACEMENT CHART

SET 299 FOLDER 4

# TROUBLE SHOOTING AIDS

## SWEEP

### HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V13 and V14. Check M1. Check C67, C66, R80, R83, R89, T1, T3A and other associated components.

DRIVE LINES

Check by substitution V13 and V14. Check C66, C67, R83, T1, T3A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V13 and V14. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V12, V13 and V14. Check C62 and C63 for open. Check L21, L22, C58, C61, R75 and other associated components.

XMAS TREE EFFECT

Check by substitution V12, V13 and V14. Check T1 and T3 for internal arcing. Check L21, L22, C59, C60, C64, C65, R76 and other associated components.

### VERTICAL

LOSS OF SWEEP

Check by substitution V10 and V11. Check waveform W6.

| If Satisfactory | If Unsatisfactory |
|---|---|
| Check T2, T3B, R66, R6, C1C and other associated components. | Check R61, R62, R7, R90, C56, C57, C54, C55, and other associated components. |

INSUFFICIENT SWEEP

Check by substitution V10 and V11. Check vertical size and vertical linearity controls for proper operation. Check R62, T2 and other associated components.

COMPRESSED AT BOTTOM

Check by substitution V10 and V11. Check R7, R62, C57, C55, and other associated components.

COMPRESSED AT TOP

Check by substitution V10 and V11. Check C1C, R66, R6, T2, T3B and other associated components.

FOLDS

Check by substitution V10 and V11. Check C54, C55, C56, C57, T2, T3B and other associated components.

## SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V7 and V10. Check C48, C49, C50, R54, R57, R58 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V10. Check vertical integrator network. Check C53, C55, C57, R61, R3 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Substitute V12. Check C58, C61, C62, C63, R73, R72, R2 and other associated components.

HORIZONTAL BENDING

Check by substitution V7, V10 and V12. Check components associated with V12.

## VIDEO

LOSS OF VIDEO

Substitute V6. Check C38, C39, R37, L17 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check C38, C39, L14, R37 and other associated components.

NEGATIVE PICTURE

Substitute V6. Check picture tube. Check R37, C38, C39 and other associated components.

SMEAR

Substitute V6. Check L13, L14, L15, L16, C38, C39 and other associated components. Check video IF alignment.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

## AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8 and V9. Check stages V8 and V9 using audio signal generator. Apply audio signal across R1B.

| If Satisfactory | If Unsatisfactory |
|---|---|
| Check audio detector and audio IF stages for component failure or change of value. | Check C44, C45, C46, C47, C2B, R48, R50, R51, T4, speaker and other associated components. |

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A10 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or no Sound".

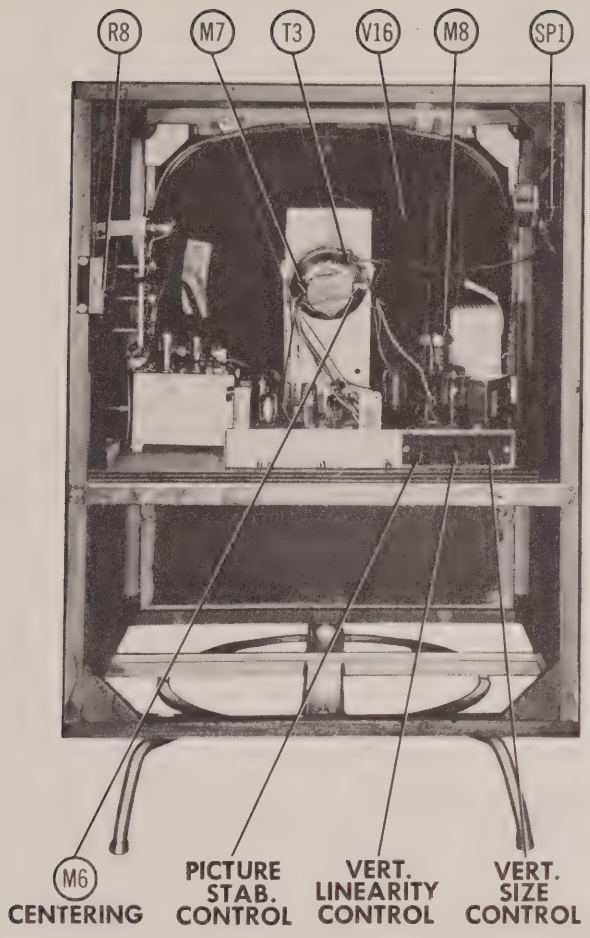
## POWER

DEAD SET

If filaments fail to light, check all tubes. These tubes are connected in series. Check AC interlock assembly. Check switch on volume control. If filaments light, check M1 and R89. Check B+ filter and decoupling network. Check M2 fuse.

SMALL AND/OR DIM PICTURE

Check M1 and R89. Check B+ filter and decoupling network.




## CABINET—REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the picture stabilizer (R5) to its maximum clockwise position.

1. Turn the horizontal hold control fully clockwise.
2. Connect a short across L22. Leads are brought to terminal strip on top of chassis (near V11) for shorting out L22.
3. Adjust the horizontal frequency slug (B1) to the center of the range over which the picture synchronizes horizontally.
4. Remove short from L22.
5. Connect the oscilloscope to point Ⓔ. Low side to chassis.
6. Adjust the horizontal phasing slug (B2) until the broad and narrow peaks are of equal amplitude as shown in Fig. 6.
7. Remove scope from point Ⓔ and chassis. The picture should be in sync and remain in synchronization over the entire range of the horizontal hold control.

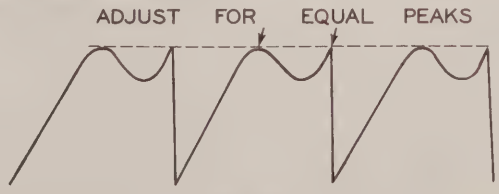
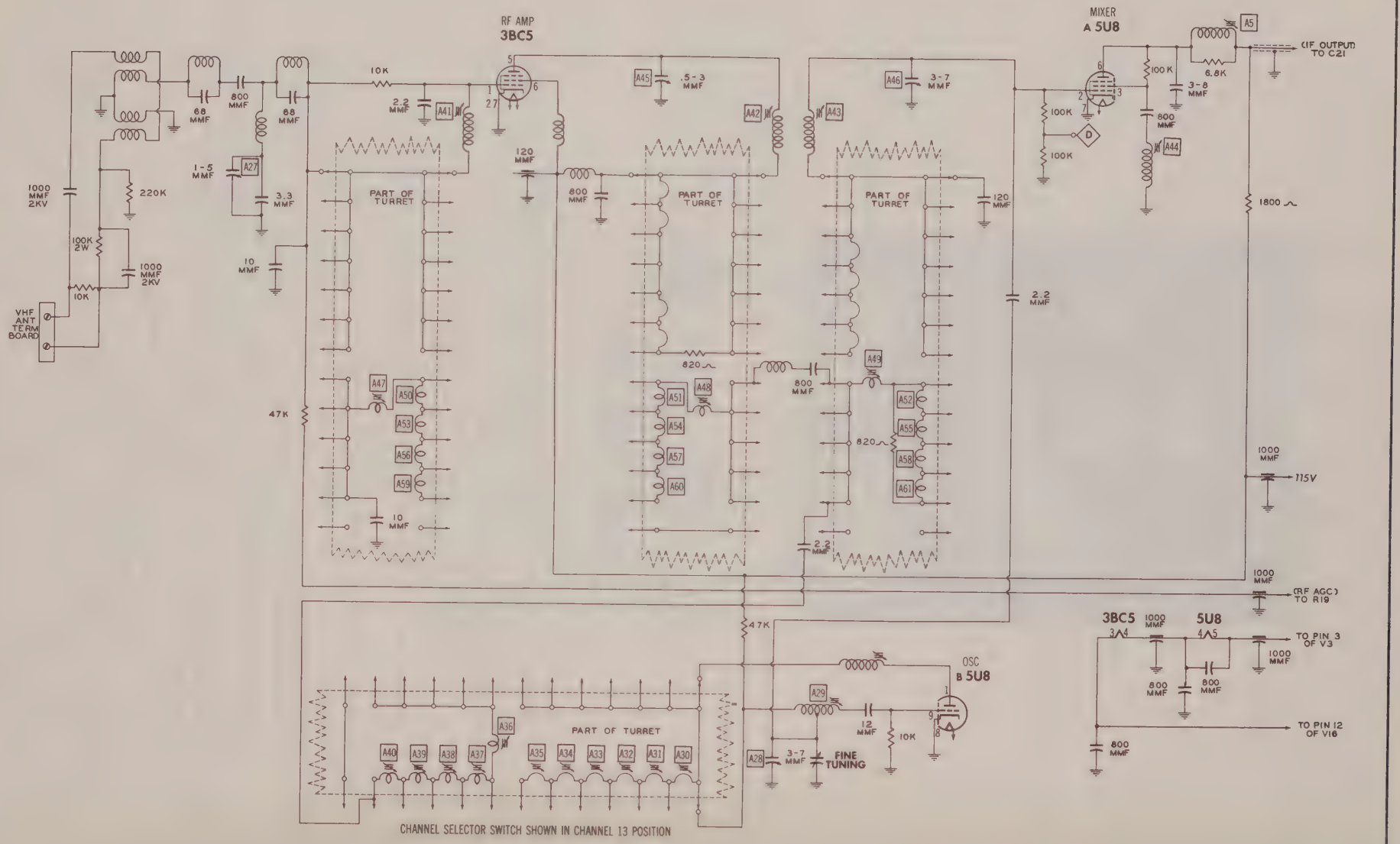



FIG. 6




VHF TUNER PART NO. 470809 USED WITH CHASSIS 120255-H, 120256-H, AND 120259-H

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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# ALTERNATE VHF TUNER SCHEMATIC

# RADIO SCHEMATIC

RADIO CHASSIS 120272-B USED WITH TV CHASSIS 120273-F

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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L F BLANKENSHIP
3074 MIRAGE ST.
DENVER, COLORADO

EMERSON MODELS 1102D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D, 1143D (Ch. 120245-D, -N, 120255-D, -F, -H, 120256-D, -F, -H, -N, 120259-D, -F, -H, -N, 120269-L, 120273-F, 120275-L, 120276-L & Radio Ch. 120272-B)

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No. | USE | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | RF Amplifier | 3BC5 | 3BC5 | 7BD | |
| V2 | Mixer-Osc. | 5AT8 | 5AT8 | 9DW | |
| V3 | 1st. Video IF Amp. | 3CB6 | 3CB6 | 7CM | |
| V4 | 2nd. Video IF Amp. Sound IF Amp. | 3CB6 | 3CB6 | 7CM | |
| V5 | 3rd. Video IF Amp. Video Detector-AGC Rectifier | 5U8 | 5U8 | 9AE | |
| V6 | Video Output | 12BY7A | 12BY7A | 9BF | |
| V7 | Sound Limiter-Sync Separator | 5U8 | 5U8 | 9AE | |
| V8 | Discriminator-AF Amplifier | 5T8 | 5T8 | 9E | |
| V9 | Audio Output | 12L8GT | 12L8GT | 7S | |
| V10 | Sync Amplifier-Vert. Mult. | 6SN7GTB | 6SN7GTB | 8BD | |
| V11 | Vert. Mult.-Vert. Output | 12W6GT | 12W6GT | 7S | |
| V12 | Horiz. AFC-Horiz. Osc. | 6SN7GTB | 6SN7GTB | 8BD | |
| V13 | Horiz. Output | 25CD6GA | 25CD6GA | 5BT | |
| V14 | Damper | 12AX4GTA | 12AX4GTA | 4CG | |
| V15 | HV Rectifier | 1B3GT | 1B3GT | 3C | |

## CATHODE-RAY TUBE

| ITEM No | REPLACEMENT DATA: EMERSON PART No. | CBS PART No. | GENERAL ELECTRIC PART No. | SYLVANIA PART No. | WESTINGHOUSE PART No. | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|---|---|
| V16 | 21AUP4A ① | 21AUP4A ① | | 21AUP4A ② | 21AUP4A ① | 12L | ① Aluminized |
| | | 21AUP4 | | 21AUP4 | 21AUP4 | 12L | ② Silver screen |
| | 21YP4 | 21YP4 | 21YP4 | 21YP4 | 21YP4 | 12L | |
| | | 21YP4A ① | 21YP4A ① | 21YP4A ② | 21YP4A ① | 12L | |
| | 17LP4 | 17LP4 | 17LP4 | 17LP4 | 17LP4 | 12L | |
| | | 17LP4A ① | 17LP4A ① | 17LP4A ② | 17LP4A ① | 12L | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING: CAP. | RATING: VOLT. | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: MALLORY PART No. | REPLACEMENT DATA: PYRAMID PART No. | REPLACEMENT DATA: SANGAMO PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C1A | 250 | 150 | 925285 | | | D-090 | |
| B | 120 | 150 | | | | MT-0250 | |
| C | 50 | 25 | | | | | |
| C2A | 250 | 150 | 925284 | | | S-110 | |
| B | 50 | 150 | | | | MT-1550 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT. | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: CENTRALAB PART No. | REPLACEMENT DATA: ERIE PART No. | REPLACEMENT DATA: MALLORY PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C3 | 1000 | 2000 | 928238 | DD30-102 | 3KV-102 | DC3021 | |
| C4 | 1000 | 2000 | 928238 | DD30-102 | 3KV-102 | DC3021 | |
| C5 | 5-8 | | | 829-10 | | | |
| C6 | 1000 | | | DD-102 | 801-001 | DC-521 | |
| C7 | .5-3 | | | 829-3 | 311S-01-0R5 | CT565A | |
| C8 | 1000 | | | DD-102 | 801-001 | DC-521 | |
| C9 | 800 | | | | | | |
| C10 | 47 | | | DD-470 | 831-470 | UC-5447 | |
| C11 | .5-3 | | | 829-3 | 311S-01-0R5 | CT565A | |
| C12 | 10 | | | | | | |
| C13 | 5 | | | | | | |
| C14 | .5-3 | | | 829-3 | 311S-01-0R5 | CT565A | |
| C15 | 1000 | | | DD-102 | 801-001 | DC-521 | |
| C16 | 800 | | | | | | |
| C17 | 800 | | | | | | |
| C18 | 5 | | | | | | |
| C19 | 800 | | | | | | |
| C20 | 150 | | 928095 | TCN-150 | N750-337-151 | | |
| C21 | 1000 | | 928077 | DD-102 | 801-001 | DC-521 | Note 1 |
| C22 | 100 | 1000 | | | | | Note 2 |
| C23 | 18 | | | TCN-18 | N750K-180 | | |
| C24 | 6.8 | | 928084 | | | PT4015 | |
| C25 | .15 | 200 | 923231 | | | PT4017 | |
| C26 | 680 | | 928076 | D6-681 | G2K-681 | UC-5368 | |
| C27 | 47 | | 928000-1 | TCN-47 | N750K-470 | NT-5447 | |
| C28 | 470 | | 928081 | D6-471 | G2K-471 | UC-5347 | |
| C29 | 1000 | | 928077 | DD-102 | 801-001 | DC-521 | |
| C30 | 47 | | 928000-1 | TCN-47 | N750K-470 | NT-5447 | |
| C31 | 330 | | 928133 | DD-331 | 811-331 | UC-5333 | |
| C32 | 1000 | | 928077 | DD-102 | 801-001 | DC-521 | |
| C33 | 1000 | | 928077 | DD-102 | 801-001 | DC-521 | |
| C34 | 5 | | 928017 | TCN-5 | N750A-050 | NT-555 | |
| C35 | 5 | | 928017 | TCN-5 | N750A-050 | NT-555 | |
| C36 | 22 | | 928244 | TCN-22 | N750K-220 | | |
| C37 | .01 | 400 | 923514 | D6-103 | G2P-333-103 | PT411 | |
| C38 | .047 | 200 | 923254 | DF-503 | | PT4147 | |
| C39 | .047 | 400 | 923254 | DF-503 | | PT4147 | |
| C40 | 150 | | 928068 | TCN-150 | N750-337-151 | | |
| C41 | 5000 | | 928109 | DD-502 | 811-005 | DC-525 | |
| C42 | 5000 | | 928109 | DD-502 | 811-005 | DC-525 | |
| C43 | 1000 | | 928121 | DD-102 | 801-001 | DC-521 | |
| C44 | .0047 | 400 | 922553 | D6-472 | G2P-333-472 | PT6247 | |
| C45 | 2200 | | 928132 | DD-222 | 811-0022 | UC-5222 | |
| C46 | .022 | 400 | 923524 | DF-203 | 817-02 | PT4123 | |
| C47 | .0047 | 400 | 922753 | D6-472 | G2P-333-472 | PT6247 | |
| C48 | .01 | 400 | 923514 | D6-103 | G2P-333-103 | PT411 | |
| C49 | 220 | 500 | 911154 | D6-221 | G2K-221 | UC-5332 | |
| C50 | .01 | 400 | 923514 | D6-103 | G2P-333-103 | PT411 | |
| C51 | .001 | 400 | 923513 | D6-102 | G2P1-102 | PT621 | |
| C52 | .001 | 400 | 923513 | D6-102 | G2P1-102 | PT621 | |
| C53 | .0047 | 400 | 922453 | D6-472 | G2P-333-472 | PT6247 | |
| C54 | .1 | 400 | 923515 | DF-104 | | PT401 | |

## CAPACITORS (cont)

| ITEM No. | RATING: CAP. | RATING: VOLT. | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: CENTRALAB PART No. | REPLACEMENT DATA: ERIE PART No. | REPLACEMENT DATA: MALLORY PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C55 | .1 | 400 | 923515 | DF-104 | | PT401 | |
| C56 | .001 | 400 | 922713 | D6-102 | GP2L-102 | PT621 | |
| C57 | .01 | 400 | 923514 | D6-103 | GP2-333-103 | PT411 | |
| C58 | 82 | 500 | 911160 | D6-820 | 801-820 | | |
| C59 | 82 | 500 | 911160 | D6-820 | 801-820 | | |
| C60 | .047 | 400 | 923554 | DF-503 | | PT4147 | |
| C61 | .047 | 200 | 923354 | DF-503 | | PT4147 | |
| C62 | .022 | 400 | 923524 | DF-203 | 817-02 | PT4122 | |
| C63 | .47 | 200 | 923355 | | | PT4047 | |
| C64 | 330 | 500 | 911167 | D6-331 | 811-331 | | |
| C65 | .01 | 500 | 922614 | | | | |
| C66 | 820 | 500 | 911172 | | 811-821 | | |
| C67 | .001 | 400 | 922513 | D6-102 | GP2L-102 | PT621 | |
| C68 | .01 | 400 | 922514 | D6-103 | GP3-333-103 | PT411 | |
| C69 | .1 | 400 | 922515 | DF-104 | | PT401 | |
| C70 | .1 | 400 | 923515 | DF-104 | | PT401 | |
| C71 | 50 | 2000 | 928097 | DD30-500 | | | |
| C72 | 1000 | | 928077 | DD-102 | 801-001 | DC-521 | |
| C73 | 1000 | | 928077 | DD-102 | 801-001 | DC-521 | |
| C74 | 1000 | | 928077 | DD-102 | 801-001 | DC-521 | |
| C75 | 1000 | | 928077 | DD-102 | 801-001 | DC-521 | |
| C76 | .01 | 400 | 922201 | DD-103 | GP3-333-103 | PT411 | |
| C77 | 1000 | 2000 | 928238 | DD30-102 | 3KV-102 | DC3021 | |
| C78 | .01 | 400 | | D6-103 | GP3-333-103 | PT411 | Note 1 |

Note 1. Not used in some versions.
Note 2. Some versions use 15MMF in this application (part #928134).

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: IRC PART No. | REPLACEMENT DATA: CLAROSTAT PART No. | REPLACEMENT DATA: CENTRALAB PART No. | REPLACEMENT DATA: MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 600Ω | ½ | 390342 | QJ-780† | RTV-390 | F3-2 | UE22S | Contrast (Panel)- Note 1 |
| B | 1Meg | ½ | | | | R2-52 | | Volume (Rear) Attach to R1A. |
| C | Switch | | | | | KB-1 | | Attach to R1B. |
| R2A | 50KΩ | ½ | 390302 | Q11-123 | A47-50K-S | B-51 | U-35 | Horizontal Hold - Note 2 |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R2A. |
| R3A | 1Meg | ½ | 390303 | Q11-137 | A47-1Meg-S | B-69 | U-54 | Vertical Hold - Note 3 |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R3A. |
| R4A | 200KΩ | ½ | 390304 | Q11-129 | A47-200K-S | B-46 | U-43 | Brightness - Note 4 |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R4A. |
| R5A | 100KΩ | ½ | 390287 | Q11-128 | A47-100K-S | BX-40 | TAP15L | Picture Stabilizer |
| B | Shaft | | Not Req. | TQ | RN-3 | Not Req. | Not Req. | Attach to R5A. |
| R6A | 500Ω | ½ | 390341 | Q11-103 | A47-500-S | AB-4 | TAP52L | Vertical Linearity |
| B | Shaft | | Not Req. | TQ | RN-3 | AK-19 | Not Req. | Attach to R6A. |
| R7A | 2Meg | ½ | 390275 | Q11-139 | A47-2Meg-S | BX-75 | TAP26L | Vertical Size |
| B | Shaft | | Not Req. | TQ | RN-3 | Not Req. | Not Req. | Attach to R7A. |

†CONCENTRIKIT EQUIVALENT; K-2 KIT, BASE ELEMENTS AND SHAFTS; B17-105, P1-121 (Panel) S13-137, R6-208 (Rear) 76-1, Switch

Note 1. Part number 390346 used in chassis 120269-L, 120275-L and 120276-L.
Part number 390356 used in chassis 120245-D, 120255-D, 130255-F, 130265-H, 120256-D, 120258-F, 120256-H, 120259-D, 120273-F.
Note 2. Part number 390347 used in chassis 120269-L, 120275-L and 120276-L.
Note 3. Part number 390348 used in chassis 120269-L, 120275-L and 120276-L.
Note 4. Part number 390349 used in chassis 120269-L, 120275-L and 120276-L.

## RESISTORS

| ITEM No. | RATING: OHMS | RATING: WATT | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R8 | 10KΩ | ½ | 350732 | BTS-10K | |
| R9 | 100KΩ | 1 | 380977 | BTA-100K | |
| R10 | 15KΩ | ½ | 340772 | BTS-15K | |
| R11 | 47KΩ | ½ | 340892 | BTS-47K | |
| R12 | 2700Ω | ½ | 340332 | BTS-2700 | |
| R13 | 220KΩ | ½ | 351052 | BTS-220K | |
| R14 | 3900Ω | ½ | 340533 | BTS-3900 | |
| R15 | 10KΩ | ½ | 350732 | BTS-10K | |
| R16 | 47KΩ | ½ | 340892 | BTS-47K | |
| R17 | 2200Ω | ½ | | BTS-2200 | |
| R18 | 3900Ω | ½ | 340532 | BTS-3900 | |
| R19 | 470KΩ | ½ | 351132 | BTS-470K | |
| R20 | 1000Ω | ½ | 350492 | BTS-1000 | |
| R21 | 82KΩ | ½ | 340752 | | |
| R22 | 470Ω | ½ | 350412 | BTS-470 | |
| R23 | 47Ω | ½ | 340172 | BTS-47 | |
| R24 | 470Ω | ½ | 350412 | BTS-470 | |
| R25 | 180Ω | ½ | 340312 | BTS-180 | |
| R26 | 15KΩ | ½ | 340772 | | |
| R27 | 470Ω | ½ | 350412 | BTS-470 | |
| R28 | 180Ω | ½ | 340312 | BTS-180 | |
| R29 | 22KΩ | ½ | 340812 | | |
| R30 | 27KΩ | ½ | 340832 | BTS-27K | |
| R31 | 330KΩ | ½ | 351092 | BTS-330K | |
| R32 | 2.2Meg | ½ | 351192 | BTS-2.2Meg | |
| R33 | 22KΩ | ½ | 340812 | | |
| R34 | 4700Ω | ½ | 340652 | | |
| R35 | 15KΩ | ½ | 340772 | | |
| R36 | 470KΩ | ½ | 351132 | | |
| R37 | 5600Ω | 2 | 780672 | BTB-5600 | |
| R38 | 15KΩ | ½ | 340772 | | |
| R39 | 150KΩ | ½ | 351052 | | Note 1 |
| R40 | 27KΩ | ½ | 340832 | BTS-27K | |
| R41 | 22KΩ | ½ | 340812 | BTS-22K | |
| R42 | 15Meg | ½ | 351492 | BTS-15Meg | |
| R43 | 18KΩ | ½ | 340792 | BTS-18K | |
| R44 | 470Ω | ½ | 350412 | BTS-470 | |
| R45 | 100KΩ | ½ | 340972 | BTS-100K | |
| R46 | 100KΩ | ½ | 340972 | BTS-100K | |
| R47 | 1Meg | ½ | 351212 | BTS-1Meg | |
| R48 | 220KΩ | ½ | 351052 | BTS-220 | |
| R49 | 470KΩ | ½ | 351132 | BTS-470K | |

| ITEM No. | RATING: OHMS | RATING: WATT | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R50 | 180Ω | 1 | 370312 | BTA-180 | |
| R51 | 470Ω | 2 | 780412 | BTB-470 | |
| R52 | 470KΩ | ½ | 351132 | BTS-470K | |
| R53 | 2.2Meg | ½ | 351292 | BTS-2.2Meg | |
| R54 | 27KΩ | ½ | 340832 | | |
| R55 | 15KΩ | ½ | 340772 | | |
| R56 | 1Meg | ½ | 351212 | | |
| R57 | 10KΩ | ½ | 340732 | | |
| R58 | 3300Ω | ½ | 340612 | BTS-3300 | |
| R59 | 100KΩ | ½ | 340972 | | |
| R60 | 100KΩ | ½ | 340972 | | |
| R61 | 680KΩ | ½ | 341172 | | |
| R62 | 220KΩ | ½ | 351052 | | |
| R63 | 2.2Meg | ½ | 351292 | | |
| R64 | 100Ω | ½ | 350252 | BTS-100 | |
| R65 | 100KΩ | ½ | | | |
| R66 | 330Ω | ½ | 340332 | | |
| R67 | 680Ω | ½ | 350452 | | |
| R68 | 680Ω | ½ | 350452 | | |
| R69 | 330KΩ | ½ | 341092 | | |
| R70 | 330KΩ | ½ | 341092 | | |
| R71 | 820KΩ | ½ | 341192 | | |
| R72 | 150KΩ | ½ | 341013 | | |
| R73 | 100KΩ | ½ | 340972 | | |
| R74 | 82KΩ | ½ | 340952 | | |
| R75 | 33000Ω | ½ | 340632 | | |
| R76 | 150KΩ | ½ | 341012 | | |
| R77 | 220KΩ | ½ | 341052 | | |
| R78 | 8200Ω | ½ | 340712 | | |
| R79 | 47KΩ | ½ | 340892 | | |
| R80 | 100KΩ | ½ | 340972 | | |
| R81 | 150KΩ | ½ | 341012 | | |
| R82 | 100Ω | ½ | 350252 | | |
| R83 | 330Ω | 1 | 370372 | BTA-330 | |
| R84 | 10KΩ | ½ | 340732 | | |
| R85 | 1KΩ | ½ | 340072 | | |
| R86 | 1.5Ω | ½ | 394142 | BW½-1.5 | |
| R87 | 27KΩ | ½ | 340832 | BW½-27K | |
| R88 | 13Ω | ½ | 394165 | | |
| R89 | 5Ω | 5 | 394158 | PW7-5 | |
| R90 | 120Ω | 1 | 370272 | BTA-120 | |
| R91 | 100KΩ | 1 | 380977 | BTA-100K | |

Note 1. Some versions use 220KΩ ½W in this application.
Note 2. Used only in chassis having tarner filament transformer.

## TRANSFORMER (FILAMENT)

| ITEM No. | RATING: PRI. | RATING: SEC. 1 | RATING: SEC. 2 | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: Halldorson PART No. | REPLACEMENT DATA: Merit PART No. | REPLACEMENT DATA: RCA TYPE No. | REPLACEMENT DATA: Stancor PART No. | REPLACEMENT DATA: Thordarson PART No. | REPLACEMENT DATA: Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | 117VAC ⑤ .05A tap ⑥ 6.3VAC 6.85A | | | 730051 ① | F5511 ①② | P-3074 ① | | P-6134 ① ④ | 21F08 ①② | F-14X ①② |

① Separate 6.3V windings.
② Tape 6.3V CT.
④ Used in chassis 120255-D, 130258-D, 120259-D, 120269-L, 120275-L & 120276-L only.

## TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: Halldorson PART No. | REPLACEMENT DATA: Merit PART No. | REPLACEMENT DATA: RCA TYPE No. | REPLACEMENT DATA: Ram PART No. | REPLACEMENT DATA: Stancor PART No. | REPLACEMENT DATA: Thordarson PART No. | REPLACEMENT DATA: Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T1 | Horiz. Output Trans. | 738109 | | | | | | | |
| | | 738103 ① | | | | | | | |
| T2 | Vert. Output Trans. | 738102 | Z1900 ②③ | A-2633 | | V302 ② | A-8142 ② ④ | 26872 | A-106X |
| | | 738105 ① | | | | | | | |
| T3A | Yoke-Horiz. (20MH) | 706214 | DF605 ④ | MDF-73 ④ | 222D1 ④ | Y70F20/43 ④ | DY-11A ④ | Y-10 ④ | Y-22-1 ④ |
| B | Vert.(37MH) | | | | | | | | |

① Alternate Emerson part number.
② Drill new mounting hole(s).
③ Use 8 to 1 turns ratio.
④ Use original yoke damping network.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE: PRI. | IMPEDANCE: SEC. | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: Halldorson PART No. | REPLACEMENT DATA: Merit PART No. | REPLACEMENT DATA: Stancor PART No. | REPLACEMENT DATA: Thordarson PART No. | REPLACEMENT DATA: Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| T4 | 1.2KΩ | 4.8Ω | 734107 | Z1101 | A-3025 | A-3332 | 26858 ① | S-12X | ① Drill one new mounting hole. |
| | | | 734104 ② | | | | | | ② Transformer used in Ch. 120245-D,-N only |

## SPEAKER

| ITEM No. | RATINGS: SIZE | RATINGS: FIELD | RATINGS: V. C. IMP. | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 6" | PM | 4.8Ω | 180140 ① | 6A1 | ① Used in Models 1114D, 1114F, 1114H, 1114L, 1115D, 1142D and 1143D |
| | 4" | PM | 4.8Ω | | 4A1 | ② Used in Models 1102D, 1102F, 1104F, 1104H, 1104J, 1105D, 1106H, 1106K, 1106L, 1108N, 1106P, 1106R, 1107D, 1107F, 1130D, 1130F and 1132F |
| | 6" | PM | 4.8Ω | 180126 ② | 6A2I | ③ Used in Model 1128F |

## COILS (RF-IF)

| ITEM No. | USE | DC RES.: PRI. | DC RES.: SEC. | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: MEISSNER PART No. | REPLACEMENT DATA: MERIT PART No. | REPLACEMENT DATA: MILLER PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | Ant. Coils | 0Ω | 0Ω | | | | | |
| L2 | RF Choke | 0Ω | | | | | | |
| L3 | RF, Mixer Grid, Osc. Coils | 0Ω | | | | | | |
| L4 | Fil. Choke | 0Ω | | | | | | |
| L5 | RF Coil | 0Ω | | | | | | |
| L6 | Conv. Plate | 0Ω | | | | | | |
| L7 | 47.25MC Trap | 0Ω | | 708213 | 20-1049 | | 6215 | |
| L8 | 1st Video IF | .3Ω | | 730215 | | | | |
| L9A | 2nd Video IF | 0Ω | 0Ω | | | | | |
| B | 1st Sound IF | 1.6Ω | | 730204 | | | | |
| L10 | RF Coil | 1.1Ω | | 708209 | 19-1003 | | 4808 | 4.6 Microhenries |
| L11A | 3rd Video IF | 0Ω | 0Ω | | | | | |
| B | 2nd Sound IF | 1.5Ω | | 730213 | | | | |
| L12 | 3rd Video IF | 0Ω | 0Ω | 730216 | 17-4523 | TV-130 | 6219 | |
| L13 | Series Peaking Coil | 1.1Ω | | 708209 | 19-1003 | | 4808 | 4.6 Microhenries |
| L14 | Series Peaking Coil | 10.5Ω | | 708099 | 19-3300 | | 6132 | 330 Microhenries |
| L15 | Shunt Peaking Coil | 13Ω | | • | • | | 6156 | 840 Microhenries-Note 1 |
| L16 | Shunt Peaking Coil | 13.5Ω | | | | | 6156 | 855 Microhenries |
| L17 | Series Peaking Coil | 10.5Ω | | 708099 | 19-3300 | | 6132 | 330 Microhenries |
| L18 | Shunt Peaking Coil | 18Ω | | 708115 | 19-3680 | | 4850 | 680 Microhenries |
| L19 | RF Coil | 1.1Ω | | 708209 | 19-1003 | | 4808 | 4.6 Microhenries |
| L20 | Discriminator | 2.7Ω | 2.9Ω | 708210 | 17-1023■ | TV-114 | 6204 | |
| L21 | Horiz. Osc. | 35Ω | 90Ω | 716083 | 20-1402▲ | TV-162▲ | 6183▲ | |
| L22 | Horiz. Phase | 29Ω | | 708180 | 20-1402▲ | TV-162▲ | 6183▲ | |

Note 1. Not used in some versions.
* Alternate part number 708115.
■ Enlarge chassis hole and drill mounting holes.
▲ Horizontal oscillator and horizontal phase coil replaced with one unit. Cut out chassis hole and drill mounting holes.

## FILTER CHOKE

| ITEM No. | RATINGS: TOTAL DIRECT CURRENT | RATINGS: D. C. RESISTANCE | RATINGS: INDUCTANCE @ CURRENT (1000 ~) | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: Halldorson PART No. | REPLACEMENT DATA: Merit PART No. | REPLACEMENT DATA: Stancor PART No. | REPLACEMENT DATA: Thordarson PART No. | REPLACEMENT DATA: Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|
| L23 | 240ADC | 23.3Ω | .64HY | 737019 | C5041 ① | | C-2328 ① | 28C41 | |

① Drill one new mounting hole.

EMERSON MODELS 1102D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D, 1143D (Ch. 120245-D, -N, 120255-D, -F, -H, -N, 120256-D, -F, -H, -N, 120259-D, -F, -H, -N, 120269-L, 120273-F, 120275-L, 120276-L & Radio Ch. 120272-B)

# PARTS LIST AND DESCRIPTIONS (Continued)

## SELENIUM RECTIFIER

| ITEM No. | RATING | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | CURRENT | EMERSON PART No. | FEDERAL PART No. | INTERNATIONAL PART No. | MALLORY PART No. | RADIO RECEPTOR PART No. | SARKES TARZIAN PART No. | |
| M1 | .300ADC | 817033 | 1238A ① | MR-350 ① | 6S-350 ① | 6QS1 | 350 ① | ① Fabricate mounting on top of chassis. |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | EMERSON PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M2 | 3AG S/B | 1A 125V | 808009 | | 3323001 | 345003 | | |

## MISCELLANEOUS

| ITEM No. | PART NAME | EMERSON PART No. | NOTES |
|---|---|---|---|
| M3 | Tuner | 470798 ① | VHF - Chassis 120259-F, 120273-F, 120255-F, 120256-F |
| | Tuner | 470786 ① | VHF - Chassis 120245-D |
| | Tuner | 470803 | VHF - Chassis 120255-D, 120256-D, 120259-D |
| | Tuner | 470818 ② | VHF - Chassis 120245-N |
| | Tuner | 470817 ② | VHF - Chassis 120256-N, 120259-N |
| | Tuner | 470809 | VHF - Chassis 120255-H, 120256-H, 120259-H |
| M4 | Tuner | 470810 | VHF-UHF - Chassis 120269-L, 120275-L, 120276-L |
| M5 | Trap | | VHF Ant. Input Filter |
| M6 | Centering Device | 708134 | Alternate part #708149 |
| M7 | Ion Trap | 708129 | Alternate part #708235 |
| M8 | Barkhausen Magnet | 708234 | |
| | Cabinet | 140654 | Models 1102D, F - Ebony |
| | Cabinet | 140654A | Models 1102D, F - Mahogany |
| | Cabinet | 140654B | Models 1102D, F - Blonde |
| | Cabinet | | Models 1102D, F - Specify color - Assorted pastel color finished |
| | Cabinet | 140642 | Models 1104F, H, J, L, 1132F - Ebony |
| | Cabinet | 140642A | Models 1104F, H, J, L, 1132F - Blonde |
| | Cabinet | 140642B | Models 1140F, H, J, L, 1132F - Mahogany |
| | Cabinet | 140706 | Model 1105D - Ebony |
| | Cabinet | 140706A | Model 1105D - Blonde |
| | Cabinet | 140706B | Model 1105D - Mahogany |
| | Cabinet | 140686 | Models 1106H, L, P - Mahogany |
| | Cabinet | 140686A | Models 1106H, L, P - Blonde |
| | Cabinet | 140687 | Models 1106J, N, R - Wood Mahogany |
| | Cabinet | 140687A | Models 1106J, N, R - Wood Blonde |
| | Cabinet | 140670 | Model 1107D - Mahogany |
| | Cabinet | 140670A | Model 1107D - Blonde |
| | Cabinet | 140671 | Model 1107F - Wood Mahogany |
| | Cabinet | 140671A | Model 1107D - Wood Blonde |
| | Cabinet | 140712 | Models 1114D, F, H, L, 1115D - Mahogany |
| | Cabinet | 140712A | Models 1114D, F, H, L, 1115D - Blonde |
| | Cabinet | 140696 | Model 1128F - Mahogany |
| | Cabinet | 140696A | Model 1128F - Blonde |
| | Cabinet | 140684 | Models 1130D, F - Wood Mahogany |
| | Cabinet | 140718 | Models 1142D, 1143D - Mahogany |
| | Cabinet | 140718A | Models 1142D, 1143D - Blonde |
| | Knob | 450209A | Fine tuning - Models 1102D, F, 1104F, H, J, L, 1106H, J, L, N, P, R, 1114D, F, H, L, 1128F, 1130D, F, 1132F, 1142D |
| | Knob | 450206A | VHF channel selector - Models 1102D, F, 1104F, H, J, L, 1106H, J, L, N, P, R, 1114D, F, H, L, 1128F, 1130D, F, 1132F, 1142D |
| | Knob | 450212A | Vert. Hold, Horiz. Hold, Brightness - All models |
| | Knob | 450208A | Contrast - All models |
| | Knob | 450207A | on-off-volume - all models |
| | Knob | 450209B | Fine tuning - For assorted pastel color finished cabinets - Models 1102D, F |
| | Knob | 450206B | VHF channel selector - For assorted pastel color finished cabinets - Models 1102D, F |
| | Knob | 450212B | Vert. Hold, Horiz. Hold, Brightness - For assorted pastel color finished cabinets - Models 1102D, F |
| | Knob | 450208B | Contrast - For assorted pastel color finished cabinets - Models 1102D, F |
| | Knob | 450207B | On-off-volume - For assorted pastel color finished cabinets - Models 1102D, F |
| | Knob | 460656A | Fine tuning - Models 1105D, 1107D, F, 1115D, 1143D |
| | Knob | 460657A | VHF channel selector - Models 1105D, 1107D, F, 1115D, 1143D |
| | Knob | 460658 | UHF channel selector - Models 1105D, 1107D, F, 1115D, 1143D |
| | Knob | 460659 | UHF indicator disc - Models 1105D, 1107D, F, 1115D, 1143D |
| | Knob | 460587 | Dial - Radio - Model 1128F |
| | Knob | 460589 | Control - Radio - Model 1128F |
| | Safety Glass | 520159 | Models 1102D, F |
| | Safety Glass | 520235 | Models 1140L, F, H, J, 1105D, 1132F |
| | Safety Glass | 520225 | Models 1106H, J, L, N, P, R, 1107D, F |
| | Safety Glass | 520227 | Models 1114D, F, H, L, 1115D, 1128F |
| | Safety Glass | 520208 | Models 1130D, F |
| | Safety Glass | 520236 | Models 1142D, 1143D |
| | Mask | 460640 | Models 1102D, F |
| | Mask | 460636B | Models 1104L, F, H, J, 1105D |
| | Mask | 460637A | Models 1106H, J, L, N, P, R, 1107D, 1107F |
| | Mask | 578014 | Models 1130D, F |
| | Mask | 460636C | Model 1132F |
| | Mask | 460652A | Models 1142D, 1143D |
| | Mask & Frame Assy. | 460639A | Models 1114D, F, H, L, 1115D, 1128F |

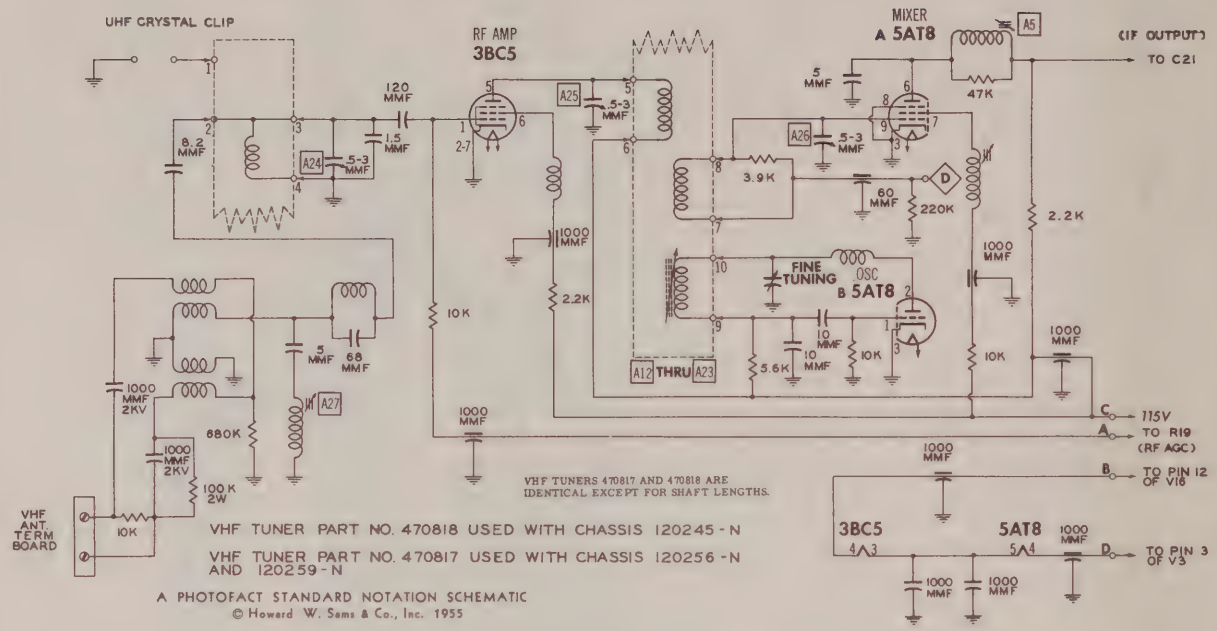
① Tuners 470798 and 470786 are identical except for shaft length.
② Tuners 470817 and 470818 are identical except for shaft length.

EMERSON MODELS 1102D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D, 1143D (Ch. 120245-D, -N, 120255-D, -F, -H, 120256-D, -F, -H, -N, 120259-D, -F, -H, -N, 120269-L, 120273-F, 120275-L, 120276-L & Radio Ch. 120272-B)

# ALTERNATE VHF-UHF TUNER SCHEMATIC


MIXER A 6U8
RF AMP 6BZ7
OSC B 6U8
UHF OSC 6AF4A
GIMMICK
FINE TUNING
(IF OUTPUT) TO C21
(RF AGC) TO A19
115V
TO TAP ON TUNING TRANSFORMER
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
UHF - VHF TUNER PART NO. 470810 USED WITH CHASSIS 120269-L, 120275-L, AND 120276-L
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1955
VHF ANT. TERM BOARD
UHF ANT. TERM BOARD

PROPERTY OF
L. F. D'ANNUNZIO-NSHIP
38 [illegible] ST.
DE[illegible], COLORADO

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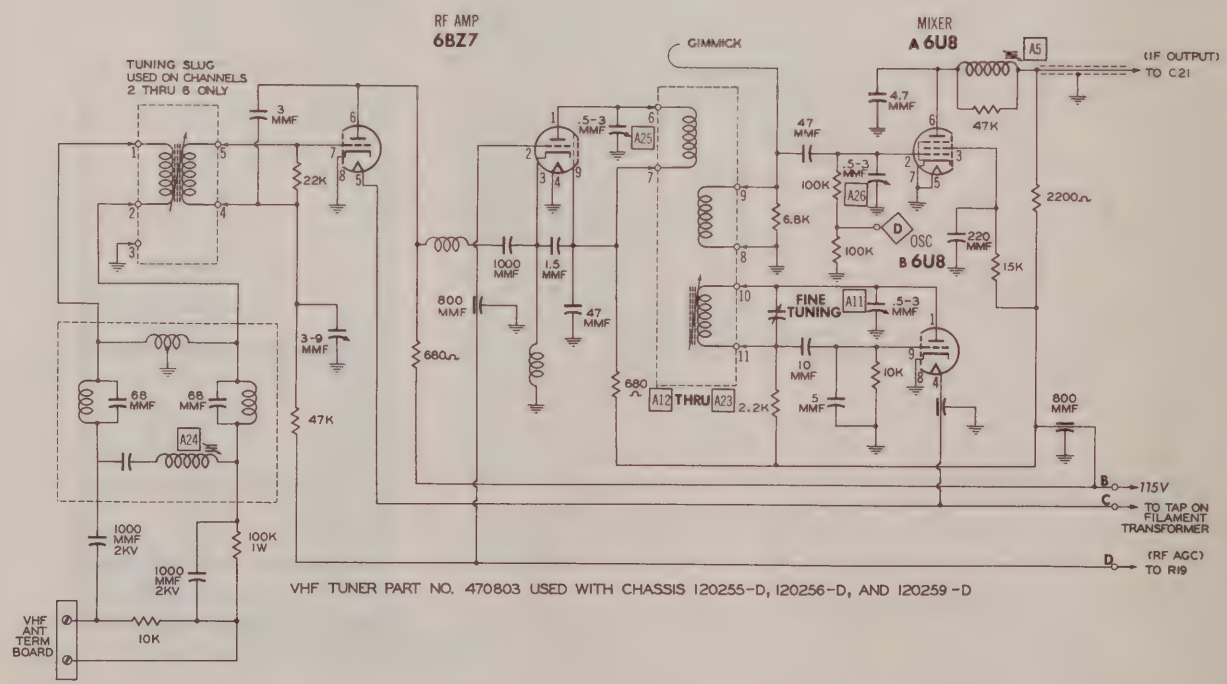
## ALTERNATE VHF TUNER SCHEMATIC

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## ALTERNATE VHF TUNER SCHEMATIC

# TROUBLE SHOOTING AIDS (cont)

DENVER, COLORADO

## HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V12, V13, V14 and V15. Check waveform W11.

| If Satisfactory | If Unsatisfactory |
|---|---|
| Check T1, T3A, C68, C69, R83, R85 and other associated components. | Check L21, L22, C59, C60, C64, C65, C67, R73, R78, R79, R87 and other associated components. |

INSUFFICIENT HIGH VOLTAGE

Check by substitution V13 and V14. Check M1. Check C67, R83, R89, T1, T3A and other associated components.

BLOOMING

Check by substitution V13, V14 and V15. Check M1. Check C66, C67, R83, R85, T1, T3A and other associated components.

## GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or no Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5 and V6. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T3 and other associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

## PRODUCTION CHANGES

The following production changes were made during later production. Whenever possible the reason for the change is also given.

TO ELIMINATE INTERNAL INTERFERENCE

To eliminate internal interference in the sound or picture, C47 is removed from chassis and connected to pin 8 of V9. Chassis incorporating this change are coded as follows:

120245-D △A
120255-D △A
120256-D △A
120256-D △A
120259-D △A
All other chassis initial production

"SNIVETS"

Under certain conditions some 25CD6GA tubes cause snivets in the picture. To eliminate this a barkhausen magnet is included around the top portion of the 25CD6GA. In the field this trap can be turned to eliminate the undesirable "snivets" and/or barkhausen.

TO INCREASE AVERAGE BACKGROUND BRIGHTNESS

R39 is decreased from 220KΩ to 150KΩ.

Pin 10 of V16 is moved from the junction of C70 and R79 to the junction of R87 and C69.

Chassis incorporating these changes are coded as follows:

120245-D △A
120255-D △$A_1$
120256-D △$A_1$
120259-D △$A_1$
All other chassis initial production

FILAMENT CHANGE

The filaments of V9 and V14 are reversed in the series filament string. Chassis incorporating this change are coded as follows:

120245-D △B
120255-F △$A_1$
120256-F △$A_1$
120259-F △$A_1$

In later production this change was eliminated and the filaments of V9 and V14 were changed back to the original hook-up. Chassis incorporating this change are coded as follows:

120245-D △$C_2$
120255-F △1
120256-F △1
120259-F △1

COMPONENT ADDED

C78 is connected from terminal "D" of the tuner (AGC line) to chassis to make lead dress of AGC tuner lead less critcial. Chassis incorporating this change are coded as follows:

120255-D △B
120255-F △B
120256-D △B
120256-F △B
120259-D △B
120259-F △B
120276-L △A

EMERSON MODELS 1102D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D, 1143D (Ch. 120245-D, -N, 120255-D, -F, -H, 120256-D, -F, -H, -N, 120259-D, -F, -H, -N, 120269-L, 120273-F, 120275-L, 120276-L & Radio Ch. 120272-B)

# SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet above and slightly to the left of the channel selector shaft.

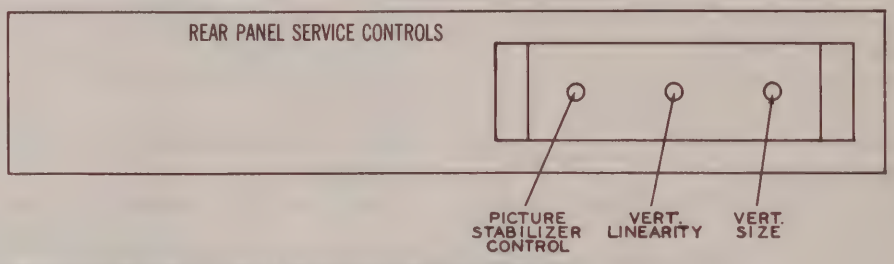
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove plastic frame from aound safety glass by pulling straight off. Remove 4 metal screws from 4 safety glass mounting brackets. Remove brackets and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION




SPECIAL ADJUSTMENTS - PICTURE STABILIZER CONTROL ADJUSTMENT

In normal signal areas the picture stabilizer control (R5) should be set at its maximum clockwise position. In noisy fringe areas rotate R5 counter clockwise for best sync stability.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until picture synchronizes horizontally .

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the sound discriminator secondary slug (A10) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

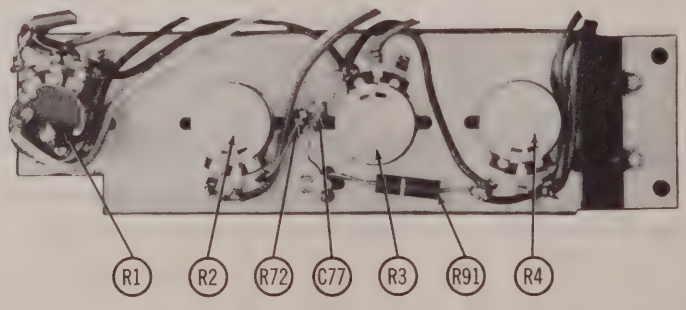
CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

# DISASSEMBLY INSTRUCTIONS

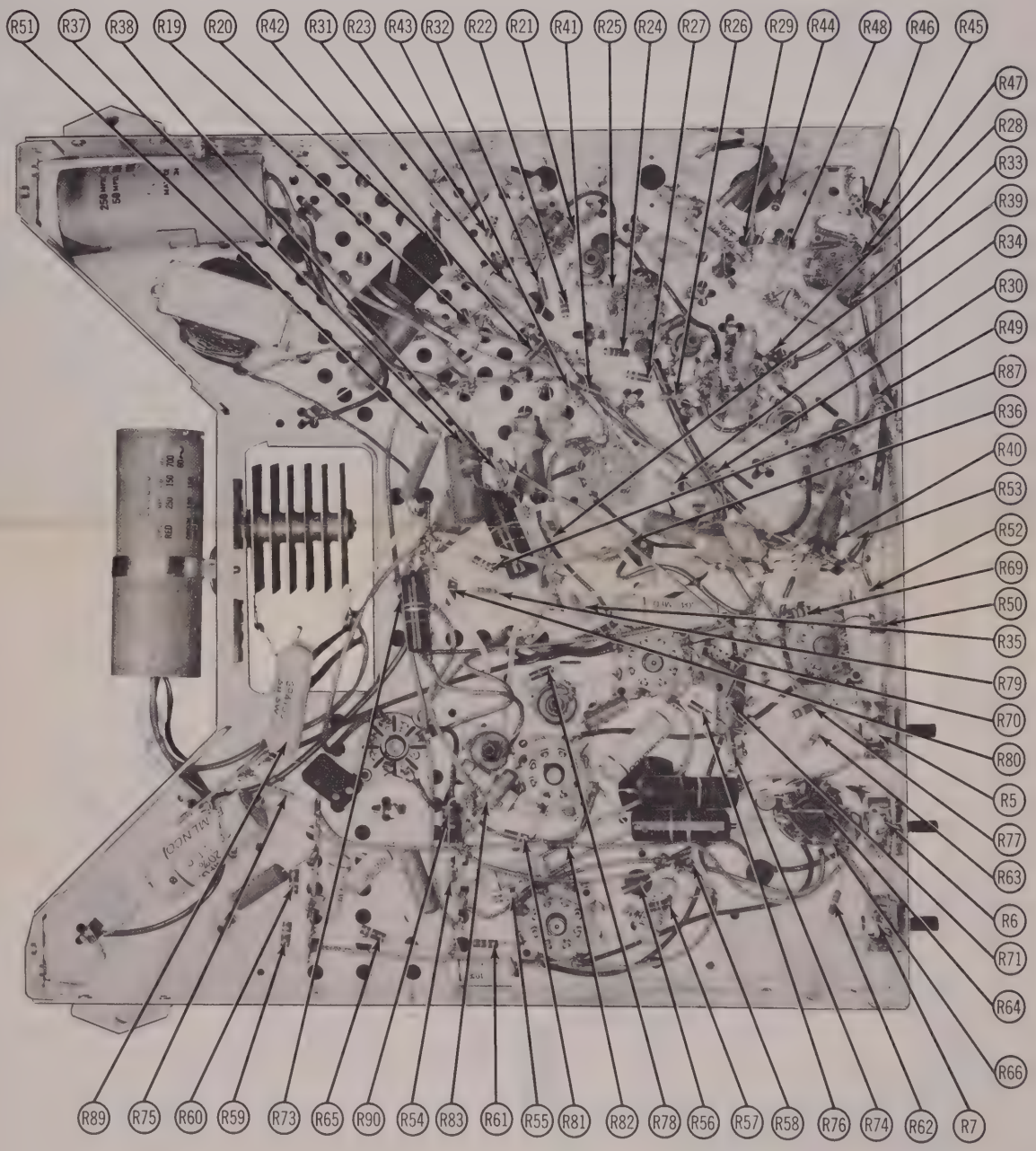
CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from side panel of the cabinet.
2. Remove 8 wood screws. Remove rear cover.
3. Remove 2 wood screws. Remove antenna terminal bracket.
4. Disconnect 2 speaker leads.
5. Remove 2 metal screws from control bracket support.
6. Remove 2 wood screws from top of picture tube support.
7. Remove 4 chassis bolts. Remove chassis.
8. Remove 2 speaker nuts. Remove speaker.




CONTROL PANEL SUB-CHASSIS

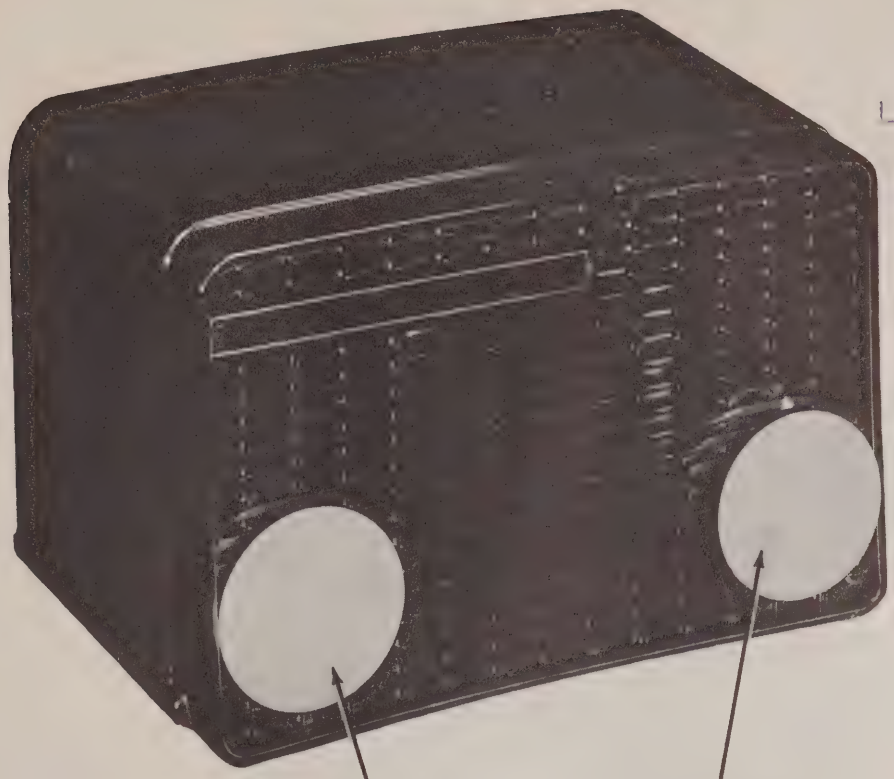
L. F. BLANKE[illegible]
3924 MEADE ST.
DENVER, COLORADO




CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MAPLE ST.
DENVER, COLORADO

MOTOROLA MODELS 55A1, 55A2, 55A3 (Ch. HS-422)




MOTOROLA MODELS 55A1, 55A2, 55A3 (Ch. HS-422)

| | |
|---|---|
| TRADE NAME | Motorola Models 55A1, 55A2, 55A3 (Ch. HS-422) |
| MANUFACTURER | Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Ill. |
| TYPE SET | AC-DC Operated AM Superheterodyne Receiver |
| TUBES (Five) | Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier |
| POWER SUPPLY | 110-120 Volts AC-DC |
| RATING | .22 Amp. @ 117 Volts AC |
| TUNING RANGE—BROADCAST | 535KC-1620KC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | .1MFD | High side to pin 7 (grid) of 12BE6 (V1). Low side to B-. | 455KC (400~ Mod.) | Tuning gang fully open. | Across Voice Coil | A1, A2, A3, A4 | Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation. |
| 2. | " | " | 1620KC | " | " | A5 | " |



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# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No. | USE | REPLACEMENT DATA: MOTOROLA PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | Converter | 12BE6 | 12BE6 | 7CH | |
| V2 | IF Amp. | 12BA6 | 12BA6 | 7BK | |
| V3 | Det. -AVC-AF Amp. | 12AV6 | 12AV6 | 7BT | |
| V4 | Audio Output | 50C5 | 50C5 | 7CV | |
| V5 | Rect. | 35W4 | 35W4 | 5BQ | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING: CAP. | RATING: VOLT. | REPLACEMENT DATA: MOTOROLA PART No. | MALLORY PART No. | PYRAMID PART No. | SANGAMO PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C1A | 50 | 150 | 23B632015 | FP213 | TM-5030-150 | D-065 | |
| B | 30 | 150 | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT. | REPLACEMENT DATA: MOTOROLA PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C2 | .05 | 200 | 8R120842 | | | PTS415 | |
| C3A | 220 | | ♦21B630180 | | | | |
| B | 5000 | | | | | | |
| C | 5000 | | | | | | |
| D | 250 | | | | | | |
| E | | | | | | | |
| C4 | .03 | 200 | 8K122226 | | | | |
| C5 | .05 | 400 | 8K121268 | | | PTS415 | |

♦ Items C3A, C3B, C3C, C3D, C3E, R6A, R6B and R6C are combined in one unit. When replacing items separately, C3D and C3E should total 250MMF.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: MOTOROLA PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1 | 1Meg | ½ | 18A632047 | | | | | Volume and switch |

## RESISTORS

| ITEM No. | RATING: OHMS | RATING: WATT | REPLACEMENT DATA: MOTOROLA PART No. | REPLACEMENT DATA: IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R2 | 22KΩ | ½ | 6K119405 | BTS-22K | |
| R3 | 3.3Meg | ½ | 6K119407 | BTS-3.3Meg | |
| R4 | 100Ω | ½ | 6K119402 | BTS-100 | |
| R5 | 3.3Meg | ½ | 6K119407 | BTS-3.3Meg | |
| R6A | 6.8Meg | ½ | ♦21B630180 | BTS-6.8Meg | |
| B | 470KΩ | ½ | | BTS-470K | |
| C | 470KΩ | ½ | | BTS-470K | |

| ITEM No. | RATING: OHMS | RATING: WATT | REPLACEMENT DATA: MOTOROLA PART No. | REPLACEMENT DATA: IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R7 | 150Ω | ½ | 6K119403 | BTS-150 | |
| R8 | 1000Ω | 1 | 6K119404 | BTA-1000 | |
| R9 | 27Ω | ½ | 6R119401 | BTS-27 | |

♦ Items C3A, C3B, C3C, C3D, C3E, R6A, R6B, R6C are combined in one unit.

# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE: PRI. | IMPEDANCE: SEC. | REPLACEMENT DATA: MOTOROLA PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 2.4KΩ | 3.4Ω | 25B632025-E | Z1101 ① | A-3025 ① | A-3332 ① | 26S58 ① | S-12X① | ① Bend mounting tabs down, mount same as original unit. |

## SPEAKER

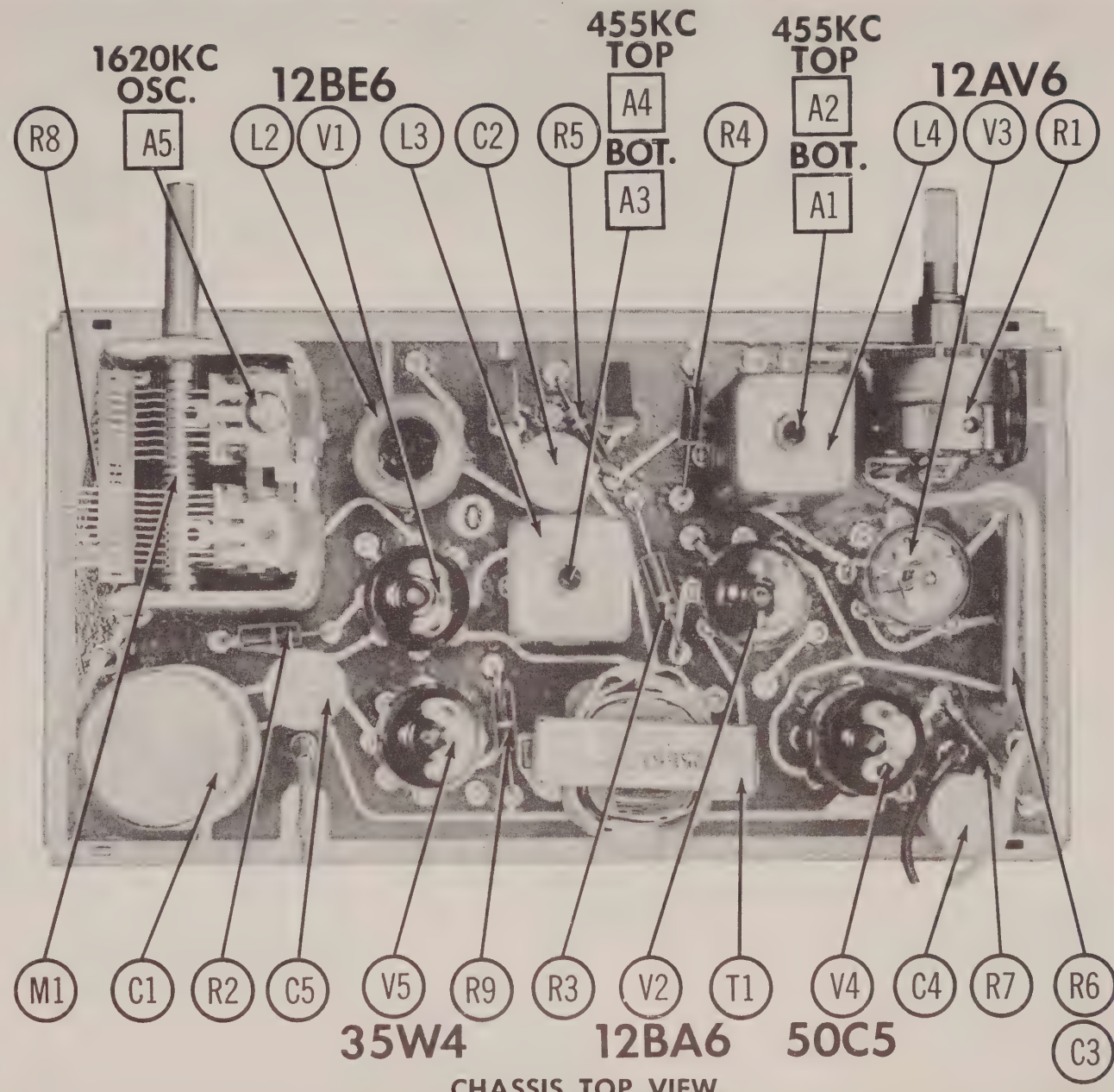
| ITEM No. | RATINGS: SIZE | RATINGS: FIELD | RATINGS: V. C. IMP. | REPLACEMENT DATA: MOTOROLA PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 4" | PM | 3.4Ω | 50C632031<br>50C632923 ① | 4A07 | ① Alternate 4" PM Speaker |

## COILS (RF-IF)

| ITEM No. | USE | DC RES.: PRI. | DC RES.: SEC. | REPLACEMENT DATA: MOTOROLA PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | Loop Ant. | 6.5Ω | | 24B632048 | | | | Includes cabinet back |
| L2 | Osc. Coil | 1.1Ω | 12.5Ω | 24B631990 | | | | |
| L3 | Input IF | 15Ω | | 24K632782 | 16-6770 | BC-355 | 12-C6 | |
| L4 | Output IF | 14Ω | 14Ω | 24K632039 | 16-6780 | BC-353 | 12-C2 | |

## MISCELLANEOUS

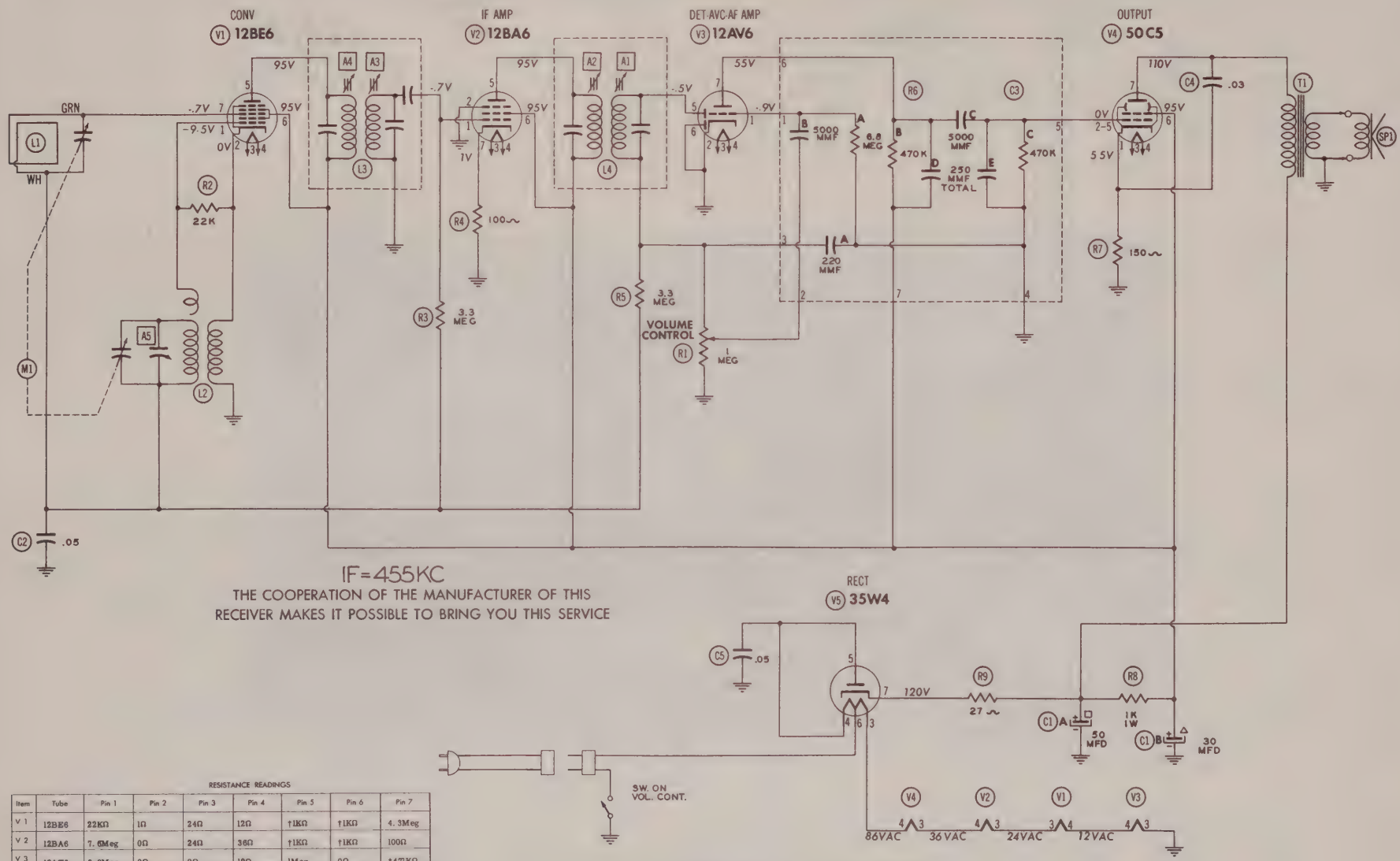
| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| M1 | Tuning Cap. | 19B632026 | 2 Gang |
| | Cabinet | 16K632878 | Model 55A1 |
| | Cabinet | 16D632040 | Model 55A2 |
| | Cabinet | 16K632524 | Model 55A3 |
| | Knob | 36B632043 | Tuning-Models 55A1, 55A2 |
| | Knob | 36K633298 | Tuning-Model 55A3 |
| | Knob | 36B632044 | On-Off-Volume-Models 55A1, 55A2 |
| | Knob | 36K633299 | On-Off-Volume-Model 55A3 |




CHASSIS TOP VIEW

MOTOROLA
Model 55A1

SET 299 FOLDER 5




RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V 1 | 12BE6 | 22KΩ | 1Ω | 24Ω | 12Ω | †1KΩ | †1KΩ | 4. 3Meg |
| V 2 | 12BA6 | 7. 6Meg | 0Ω | 24Ω | 36Ω | †1KΩ | †1KΩ | 100Ω |
| V 3 | 12AT6 | 6. 8Meg | 0Ω | 0Ω | 12Ω | 1Meg | 0Ω | †47KΩ |
| V 4 | 50C5 | 150Ω | 470KΩ | 36Ω | 86Ω | 470KΩ | †1KΩ | †200Ω |
| V 5 | 35W4 | NC | NC | 86Ω | 127Ω | 127Ω | 121Ω | 100KΩ |

†MEASURED FROM PIN 7 OF V5.
NC-NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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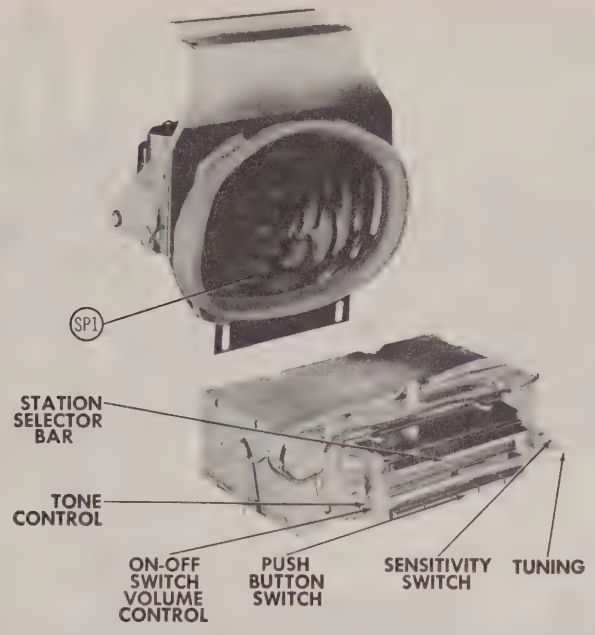
PACKARD MODELS
472047, 472048




| | |
|---|---|
| TRADE NAME | Packard Models 472047, 472048 (For all 1955 Series Packard & Packard Clipper Cars) |
| SUPPLIER | Packard Motor Car Co., Detroit 32, Michigan |
| TYPE SET | Battery Operated Custom Built AM Superheterodyne Automobile Receiver |
| TUBES (Eight) | Types 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12BF6 Det.-AVC-AF Amp., (2) 12V6GT Output, 12AU7 Trigger, 0Z4 Rectifier |
| POWER SUPPLY | 12 Volt Storage Battery — RATING 3.4 Amp. @ 12.6 Volts DC |
| TUNING RANGE—BROADCAST | 540KC-1600KC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Set tone control to "treble".
Set sensitivity control to position "2".

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | .1MFD | High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis. | 260KC (400%Mod) | High frequency end stop | DC probe to point A . Common to chassis. | A1, A2, A3 | Adjust for maximum deflection. |
| 2. | " | " | " | " | " | A4 | Adjust for MINIMUM deflection. |
| 3. | 68MMF | High side thru dummy to antenna receptacle. Low side to chassis. | 1615KC | " | " | A5, A6, A7 | Check A8 (osc. core). Rear of core should be 1 25/32" from mounting end of coil form. Adjust A5, A6 and A7 for maximum deflection. |
| 4. | " | " | 600KC | Tune to 600KC signal | " | A9, A10 | " |
| 5. | " | " | 1615KC | Tune to 1615KC signal | " | A6, A7 | " |
| 6. | " | " | 1000KC | Tune to 1000KC signal | " | | Adjust pointer adjustment screw so pointer reads 1000KC. |

With receiver installed and antenna fully extended, tune to weak station between 600KC and 1000KC. Adjust A7 for maximum volume.

PUSHBUTTON ADJUSTMENT

1. Open the hinged door below the dial exposing the selector tabs.
2. Tune in the desired signal nearest the left end of the dial.
3. Move the first selector tab (one farthest left) until it lines up with the pointer tip.
4. Repeat set-up steps 2 and 3 for the remaining selector tabs, choosing stations from left to right on the dial.
5. Check the settings of each selector tab by depressing the corresponding station selector button. If the correct station is not tuned in, readjust the selector tab.

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# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No. | USE | REPLACEMENT DATA | | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| | | PACKARD PART No. | STANDARD REPLACEMENT | | |
| V1 | RF Amp. | 12BA6 | 12BA6 | 7BK | |
| V2 | Conv. | 12BE6 | 12BE6 | 7CH | |
| V3 | IF Amp. | 12BA6 | 12BA6 | 7BK | |
| V4 | Det. -AVC-AF Amp. | 12BF6 | 12BF6 | 7BT | |
| V5 | Audio Output | 12V6GT | 12V6GT | 7AC | |
| V6 | Audio Output | 12V6GT | 12V6GT | 7AC | |
| V7 | Trigger | 12AU7 | 12AU7 | 9A | |
| V8 | Rect. | 0Z4 | 0Z4 | 4R | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | PACKARD PART No. | MALLORY PART No. | PYRAMID PART No. | SANGAMO PART No. | |
| C1A | ■20 | 400 | M-908 | FP345. 8 | TM-3036 | T-550 | |
| B | ▲20 | 400 | | | | | |
| C | 20 | 25 | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.**

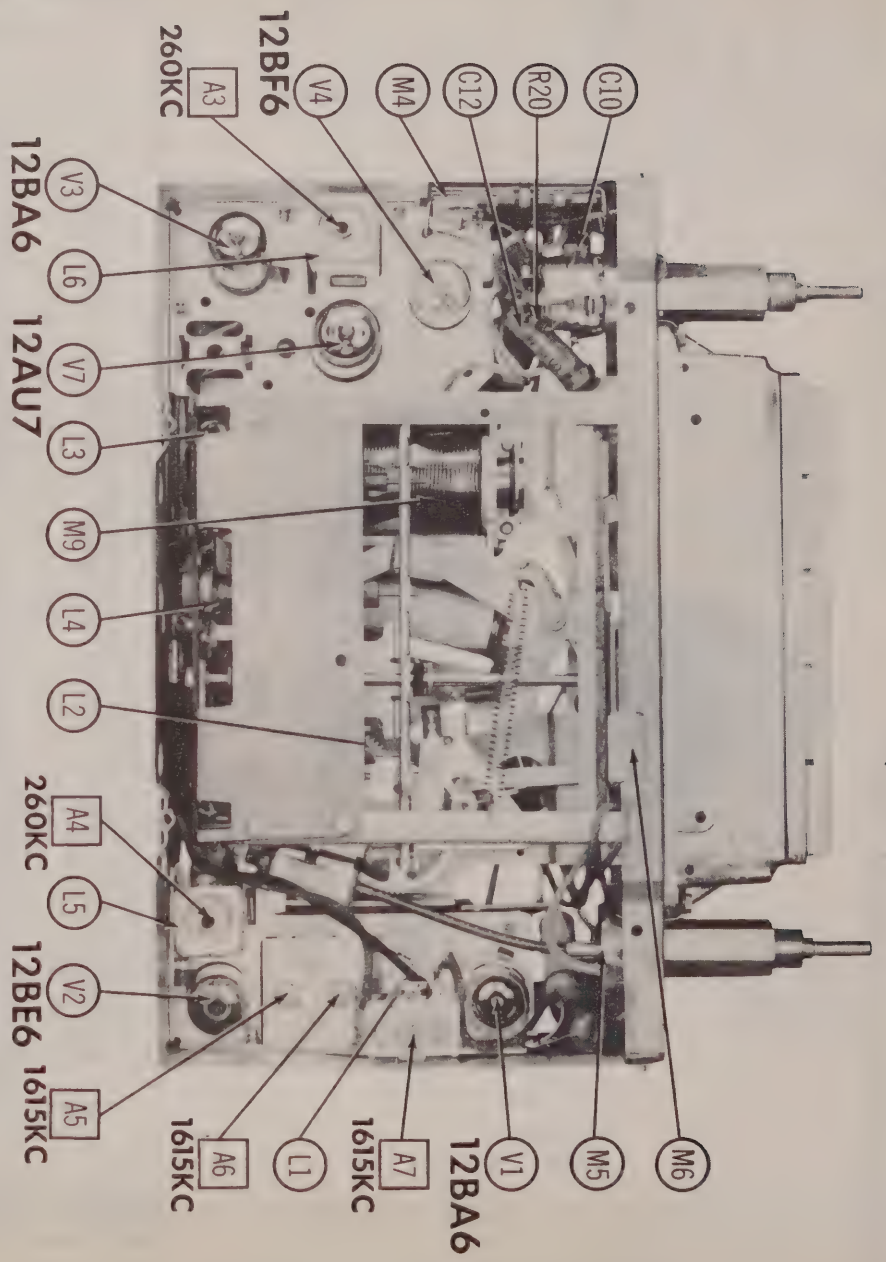
| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | PACKARD PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | |
| C2 | . 05 | 200 | 6512 | DF-503 | | PT415 | |
| C3 | . 05 | 200 | 6512 | DF-503 | | PT415 | |
| C4 | .1 | 400 | 6513 | DF-104 | | PT401 | |
| C5 | 68 | 500 | G-680 | TCZ-68 | NPO-337-680 | | |
| C6 | 39 | | G-390 | | | | |
| C7 | 260 | | 7257567 | | | | |
| C8 | . 05 | 200 | 6512 | DF-503 | | PT415 | |
| C9 | 100 | 500 | 1219498 | TCZ-100 | NPO-337-101 | MCE235 | |
| C10 | 68 | 500 | G-680 | TCZ-68 | NPO-337-680 | | |
| C11 | . 003 | 600 | 6529 | D6-302 | GP2-333-302 | PT623 | |
| C12 | . 002 | 600 | 6352 | D6-202 | GP2-333-202 | PT622 | |
| C13 | .1 | 400 | 6513 | DF-104 | | PT401 | |
| C14 | . 015 | 600 | 7237719 | DD16-153 | | PT6115 | |
| C15 | 100 | | G-101 | DD-101 | 801-101 | UC-531 | |
| C16 | . 003 | 1000 | H-302 | DD16-302 | 1R5KV-332 | PT1623 | |
| C17 | 100 | 500 | 1219498 | TCZ-100 | NPO-337-101 | MCE235 | |
| C18 | 2000 | | 6528 | DD-202 | 801-002 | DC522 | |
| C19 | . 5 | 200 | 6592 | | | PT405 | |
| C20 | . 007 | 1600 | H-702 | DD16-702 | | PT1627 | |
| C21 | . 47 | 100 | 6592 | | | RF480 | |
| C22 | . 47 | 100 | 6592 | | | RF480 | |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | PACKARD PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | |
| R1A | 500KΩ | | 7266091 | QJ-826A♦ | | | UE1479S | Tone (Panel) |
| B | 750KΩ | | | | | | | Volume (Rear) Tap at 180KΩ |
| C | Switch | | | | | | | Attach to R1B. |

♦CONCENTRIKIT EQUIVALENT; K-8 KIT, BASE ELEMENTS AND SHAFTS; B13-133, P14-130 (Panel)
B13-137X, R9-214 (Rear)
S29 (Bushing)
76-1 (Switch)

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|
| | OHMS | WATT | PACKARD PART No. | IRC PART No. | |
| R2 | 2.2Meg | ½ | 1239 | BTS-2.2Meg | |
| R3 | 1Meg | ½ | 1235 | BTS-1Meg | |
| R4 | 10KΩ | 1 | 1174 | BTA-10K | |
| R5 | 100Ω | ½ | 1113 | BTS-100 | |
| R6 | 1.5Meg | ½ | 1237 | BTS-1.5Meg | |
| R7 | 330KΩ | ½ | 1229 | BTS-330K | |
| R8 | 22KΩ | ½ | 1215 | BTS-22K | |
| R9 | 12KΩ | 1 | 1276 | BTA-12K | |
| R10 | 10Ω | ½ | 1101 | BTS-10 | |
| R11 | 150Ω | ½ | 1115 | BTS-150 | |
| R12 | 1Meg 5% | ½ | 1220169 | BTS-1Meg 5% | |
| R13 | 1.5Meg 5% | ½ | 1219492 | BTS-1.5Meg 5% | |
| R14 | 47KΩ | ½ | 1219 | BTS-47K | |
| R15 | 1Meg | ½ | 1235 | BTS-1Meg | |
| R16 | 2.2Meg | ½ | 1239 | BTS-2.2Meg | |
| R17 | 47KΩ | 1 | 1220188 | BTA-47K | |
| R18 | 1000Ω | ½ | 1125 | BTS-1000 | |

| ITEM No. | RATING | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|
| | OHMS | WATT | PACKARD PART No. | IRC PART No. | |
| R19 | 3300Ω | ½ | 1131 | BTS-3300 | |
| R20 | 100KΩ | ½ | 1223 | BTS-100K | |
| R21 | 360Ω 5% | 1 | 7234563 | BW1-360 5% | |
| R22 | 120KΩ | ½ | 1224 | BTS-120K | |
| R23 | 10KΩ | 1 | 1174 | BTA-10K | |
| R24 | 47KΩ | 1 | 1259 | BTA-47K | |
| R25 | 5.6Meg | ½ | 1244 | BTS-5.6Meg | |
| R26 | 220KΩ | ½ | | BTS-220K | Note 1 |
| R27 | 220KΩ | ½ | | BTS-220K | Note 1 |
| R28 | 750Ω 5% | ½ | 7266321 | BTS-750 5% | |
| R29 | 3900Ω | 1 | 1169 | BTA-3900 | |
| R30 | 33KΩ 5% | 1 | 1259 | BTA-33K 5% | |
| R31 | 1000Ω | ½ | 1125 | BTS-1000 | |
| R32 | 22KΩ | ½ | 1215 | BTS-22K | |
| R33 | 1800Ω | 2 | | BW2-1800 | Note 2 |
| R34 | 15KΩ | 1 | 1253 | BTA-15K | |

Note 1. Not used in some versions.
Note 2. Mfgr. recommends replacing with 2700Ω 2W resistor and a 5600Ω 1W resistor in parallel. (IRC Part No. BW2-2700 & BTA-5600).

## TRANSFORMER (VIBRATOR)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | PACKARD PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 12.6VCT @2.06A | 560VCT .069A | | | 6065 | | P-2861 | P-6489 | 22R52 | |

## TRANSFORMER (INPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | PACKARD PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T2 | 1.8KΩ CT (RES) | | | | 6061 | | | | | |

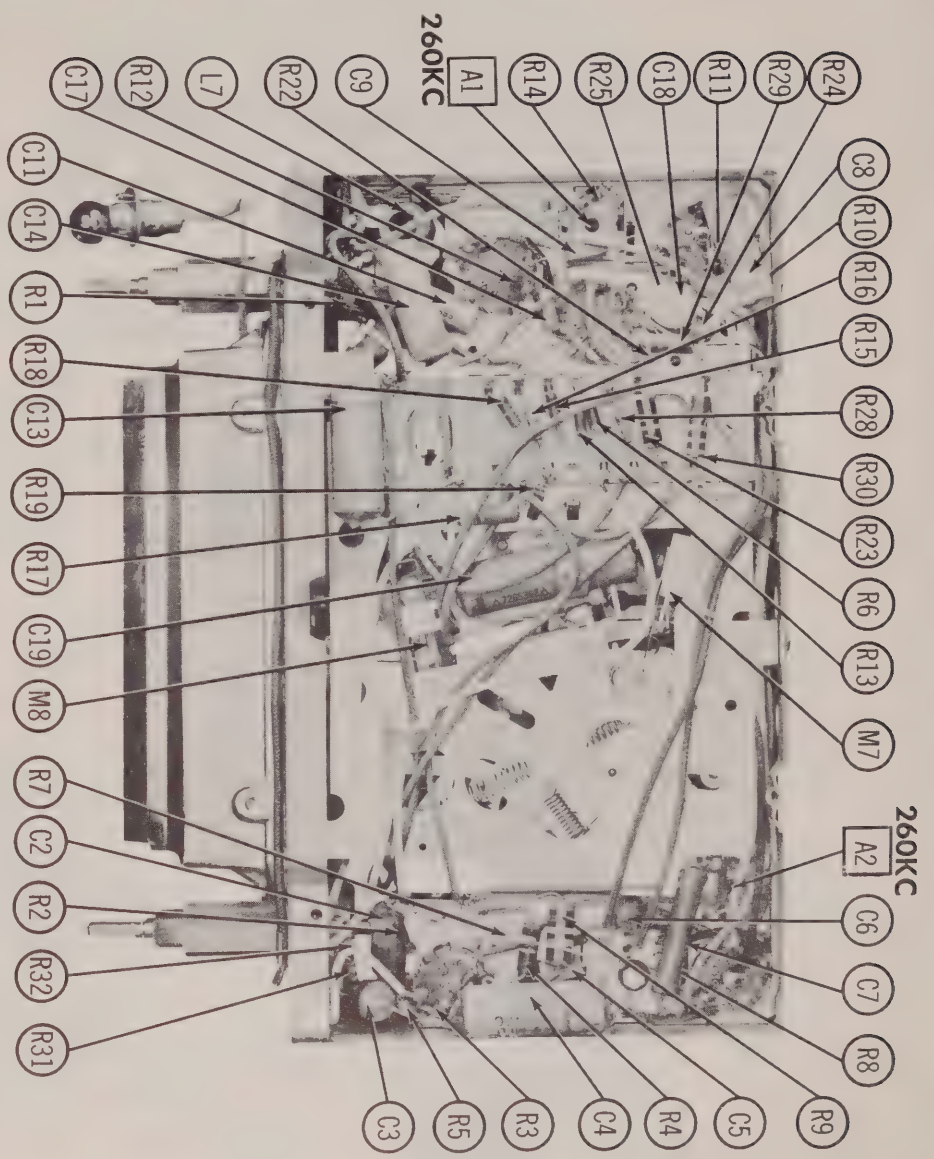
## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | PACKARD PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T3 | 7.9KΩ | 3.8Ω | 6063 | Z1009 | A-2936 | A-3852 | 24S61 | S-15X | |

## SPEAKER

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | PACKARD PART No. | QUAM PART No. | |
| SP1 | 6 x 9" | PM | 3.8Ω | 7266144 | 69A3 | |

## CHASSIS—BOTTOM VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | PRI. | SEC. | PACKARD PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | |
| L1 | Ant. Coupling Coil | .7Ω | | 7255738 | 19-1004 | | 4610 | 7 Microhenries |
| L2 | Ant. Coil | 10.5Ω | | 7257979 | | | | |
| L3 | RF Coil | 10.5Ω | | 7257979 | | | | |
| L4 | Osc. Coil | 1Ω | 4.3Ω | 7263287 | | | | |
| L5 | Input IF | 42Ω | 42Ω | 1219508 | 16-6752 | BC-350 | 12-H1 | |
| L6 | Output IF | 33Ω | 33Ω | 1220204 | 16-6754 | BC-354 | 12-H6 | |
| L7 | Fil. Choke | 0Ω | | 1217846 | 19-4215 | | 5221 | 1.4 Microhenries |
| L8 | Vib. Hash Choke | .1Ω | | 7265389 | | | | 42 Microhenries |

## VIBRATOR

| ITEM No. | TYPE | INPUT VOLTS | FRE-QUENCY | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | | | PACKARD PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | RADIART PART No. | |
| M1 | Interruptor | 12.6V | 115∿ | 8550 | 6330 | G-874/ G-883 | 6330 | |

## FUSES

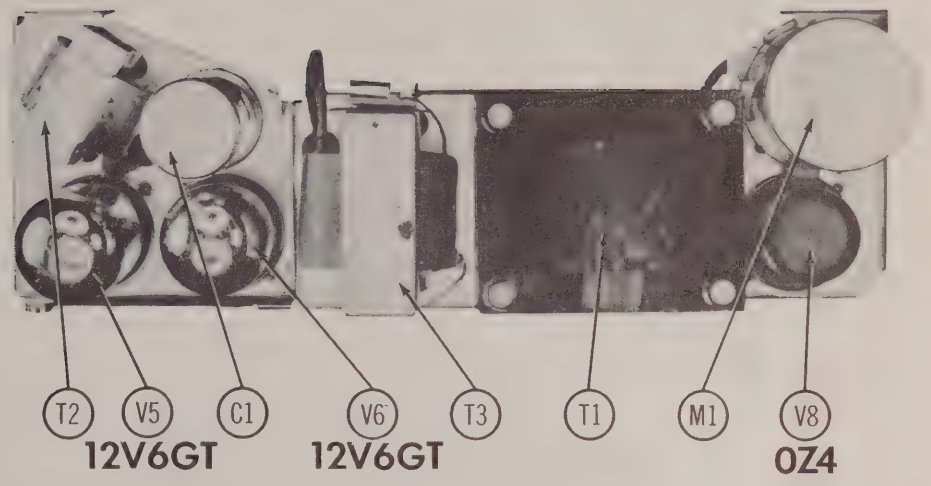
| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | PACKARD PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M2 | 7AG | 7½A | 455640 | | 30307.5 (7AG 7½A) | | AGW 7½A | |

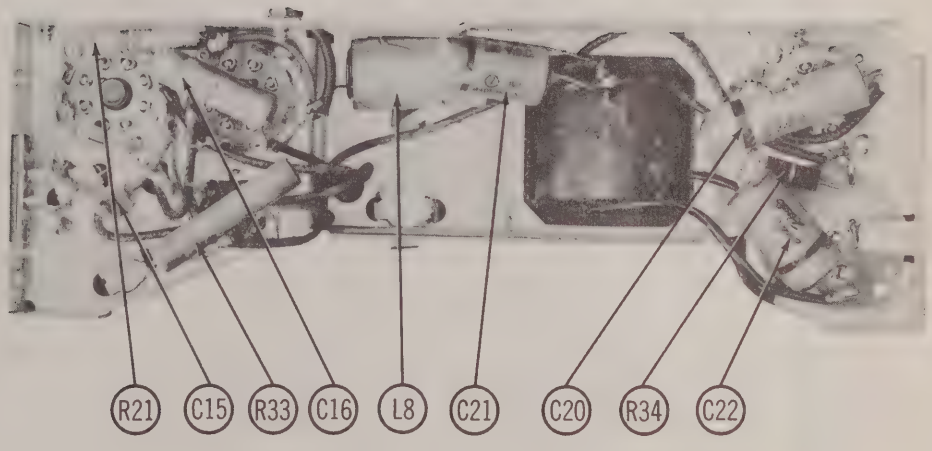
# PARTS LIST AND DESCRIPTIONS (Continued)

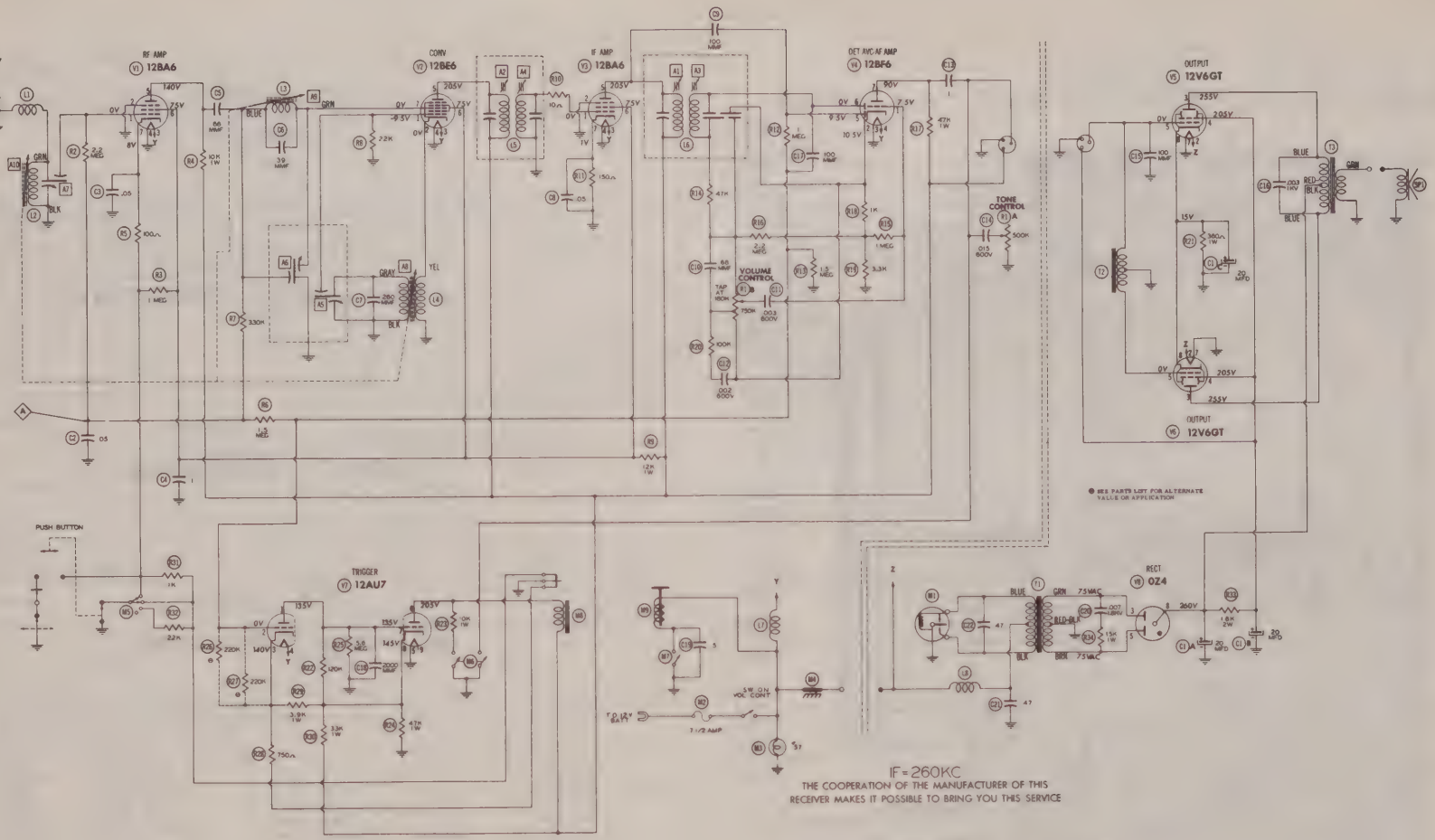
## MISCELLANEOUS

| ITEM No. | PART NAME | PACKARD PART No. | NOTES |
|---|---|---|---|
| M3 | Dial Light | | #57 |
| M4 | Spark Plate | 1220308 | |
| M5 | Switch | 7266086 | Sensitivity |
| M6 | Switch | 7265300 | Station Selector |
| M7 | Switch | 7263340 | Tuner Return |
| M8 | Relay | 1220326 | |
| M9 | Solenoid | 1220685 | Includes plunger assy. |
| A5,A6 | Trimmer Cap. | 7242454 | Dual Trimmer (Osc. & RF) |
| A7 | Trimmer Cap. | 7266240 | Ant. Trimmer |
| | Pushbutton and Slide Assy. | 7266118 | Model 472047 |
| | Pushbutton and Slide Assy. | 7266078 | Model 472048 |
| | Dial Glass | 7266247 | Model 472047 |
| | Dial Glass | 7263586 | Model 472048 |
| | Selector Tab | 1220192 | Indicator (Set of 5) |
| | Pointer Assy. | 7265297 | Model 472047 |
| | Pointer Assy. | 7266074 | Model 472048 |
| | Dial | 7266124 | Model 472047 |
| | Dial | 7266085 | Model 472048 |

L. F. [illegible]
[illegible]
DENVER, COLORADO






1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 ohms per volt.
3. Socket connections are shown as bottom view.
4. Measured values are from socket-pin-to-common negative.
5. Battery voltage maintained at 2.5 volts for voltage readings.
6. Normal variations in components and tube characteristics may permit a variation of ± 15% in voltage and resistance readings.
7. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| * | 12BA6 | 1.25M eg | 0Ω | 3Ω | 0Ω | 72.5KΩ | 72.5KΩ | 180Ω (TO CHAS) | | |
| * 2 | 12BE6 | 122KΩ | 1Ω | 3Ω | 0Ω | 71.5KΩ | 72.5KΩ | 3.25M eg | | |
| * 3 | 12BA6 | 60Ω | 0Ω | 3Ω | 0Ω | 71.5KΩ | 72.5KΩ | 180Ω | | |
| * 4 | 12BF6 | 1.5M eg | 4.5KΩ | 0Ω | 2Ω | 700Ω | 2.5M eg | 7.5KΩ | | |
| * 5 | 12V6GT | NC | 2Ω | 73000Ω | 71.5KΩ | 1KΩ | TP | 0Ω | 3000Ω | |
| * 6 | 12V6GT | NC | 3Ω | 73000Ω | 71.5KΩ | 1KΩ | TP | 0Ω | 3000Ω | |
| * 8 | 0Z4 | 71.5KΩ | 1.5M eg | 74KΩ | 1Ω | 0Ω | 71.5KΩ | 71.5KΩ | 134KΩ | 0Ω |
| 854 | | TP | NC | 3000Ω | NC | 3000Ω | NC | TP | 250KΩ | |

ALL MEASUREMENTS WITH SENSITIVITY CONTROL IN MAXIMUM SENSITIVITY POSITION
*MEASURED FROM PIN 8 OF V3.
†SENSITIVITY CONTROL IN MINIMUM SENSITIVITY POSITION
TP-TIE POINT
NC-NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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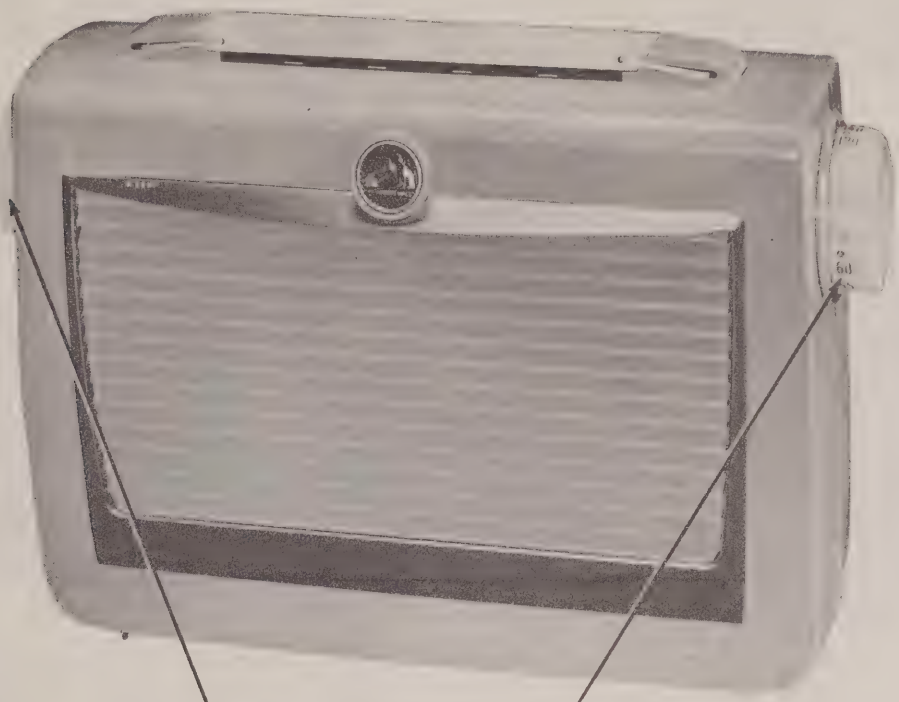
RCA VICTOR
MODELS 6-BX-5, 6-BX-6A, B, C (Ch. RC-1149)




RCA VICTOR
MODELS 6-BX-5, 6-BX-6A, B, C (Ch. RC-1149)

| | |
|---|---|
| TRADE NAME | RCA Victor Models 6-BX-5, 6-BX-6A, B, C (Ch. RC-1149) |
| MANUFACTURER | RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 2, N. J. |
| TYPE SET | Three Power Portable AM Superheterodyne, Receiver |
| TUBES (Four) | Types 1R5 Conv., 1U4 IF Amp., 1U5 Det. -AVC-AF Amp., 3V4 Output |
| POWER SUPPLY RATINGS | 110-120 Volts AC/DC (or) 3 Volts "A" Supply, & 67.5 Volts "B" Supply<br>.120 Amp. @ 117 Volts AC (or) 150MA @ 3 Volts DC & 9MA @ 67.5 Volts DC |
| TUNING RANGE—BROADCAST | 540KC-1600KC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | .01MFD | High side to antenna lug on gang. Low side to chassis. | 455KC (400~ Mod.) | Quiet point at high frequency end of dial. | Across Voice Coil | A1, A2, A3, A4 | Adjust for maximum output. IF AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation. |
| 2. | | Loop (Radiated) | 1620KC | Tuning gang fully open. | | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | | " | 1400KC | Tune to 1400KC signal. | " | A6 | " |
| 4. | | " | 600KC | Tune to 600KC signal. | " | A7 | Adjust for maximum output while rocking tuning gang. |

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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# PARTS LIST AND DESCRIPTIONS

RCA VICTOR
Model 6-BX-5

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No. | USE | REPLACEMENT DATA | | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| | | RCA Victor PART No. | STANDARD REPLACEMENT | | |
| V1 | Converter | 1R5 | 1R5 | 7AT | |
| V2 | IF Amp. | 1U4 | 1U4 | 6AR | |
| V3 | Det. -AVC-AF Amp. | 1U5 | 1U5 | 6BW | |
| V4 | Output | 3V4 | 3V4 | 6BX | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | RCA Victor PART No. | MALLORY PART No. | PYRAMID PART No. | SANGAMO PART No. | |
| C1A | 40 | 150 | | TCT3114 | TDL-403020-150 | FMT-310 | |
| B | 20 | 150 | 100077 | TC2501 | TD-100-25 | MTH-2510 | |
| C | 20 | 150 | | | | | |
| D | 100 | 25 | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | RCA Victor PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | |
| C2 | .033 | 400 | 73552 | DF-303 | | PT4133 | |
| C3 | 56 | | 100085 | D6-560 | GP1K-560 | UC-5456 | |
| C4 | 10000 | | 73960 | DD-103 | 811-01 | DC511 | |
| C5 | .0022 | | 77942 | D6-222 | GP2-333-222 | PT6222 | |
| C6 | .0047 | | 100083 | D6-472 | GP2-333-472 | PT6247 | |
| C7A | 100 | | | | | UC-531 | |
| B | 5000 | | ♦100081 | ♦PC-92 | ♦1407-02 | UC-525 | |
| C | 2000 | | | | | UC-520 | |
| C8 | .0022 | 200 | 77446 | D6-222 | GP2-333-222 | PT6222 | |
| C9 | .22 | 200 | 79740 | | | PT4022 | |
| C10 | 10000 | | 79918 | DD-103 | 811-01 | DC511 | |
| C11 | .1 | 400 | 77423 | DF-104 | | PT401 | |

♦ Items C7A, C7B, C7C, R12A, R12B and R12C are combined in one unit.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | RCA Victor PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | |
| R1A | 1Meg | ½ | 100074 | Q13-137 | A47-1Meg-Z | AB-70 | U-53 | Volume |
| B | Shaft | | Not Req. | Not Req. | FS-3 | AK-3 | Not Req. | Attach to R1A. |
| C | Switch | | Not Req. | 76-2 | SWE-20 | KB-2 | US-27 | Attach to R1A. |

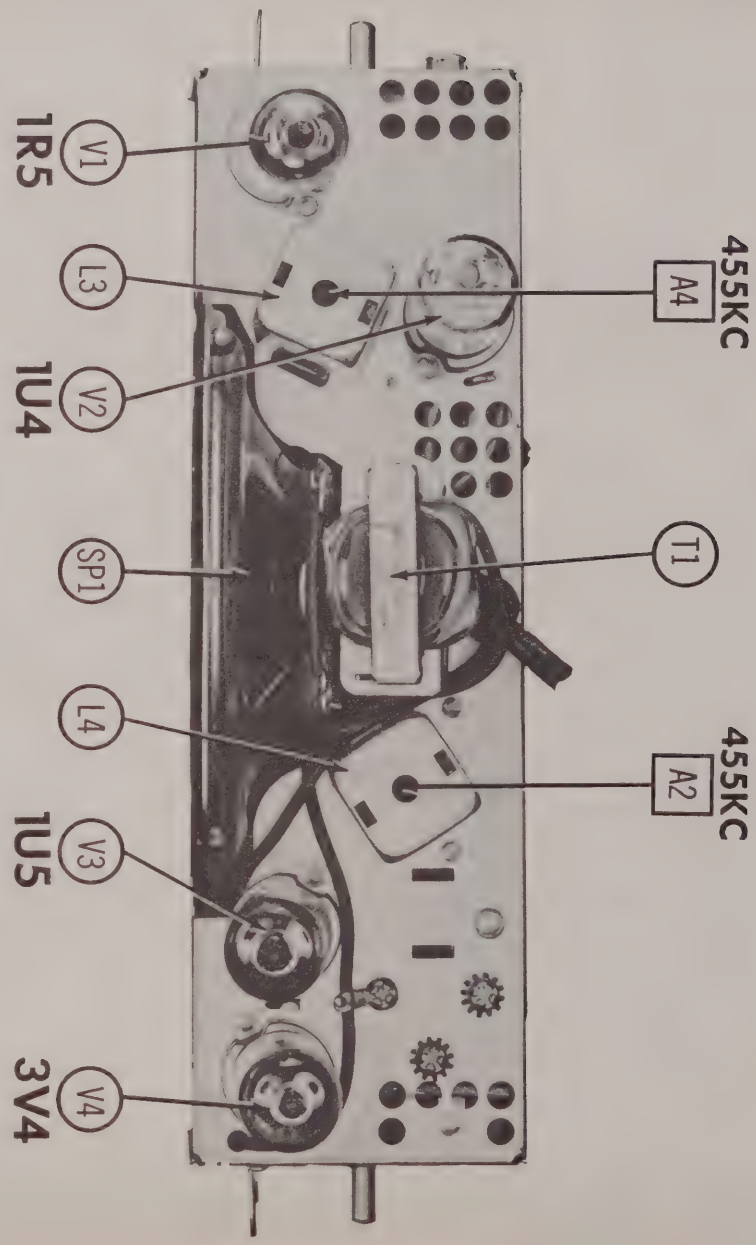
## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|
| | OHMS | WATT | RCA Victor PART No. | IRC PART No. | |
| R2 | 220Ω | ½ | 502122 | BTS-220 | |
| R3 | 100KΩ | ½ | 502410 | BTS-100K | |
| R4 | 15KΩ | ½ | 502315 | BTS-15K | |
| R5 | 270Ω | ½ | 502127 | BTS-270 | |
| R6 | 4.7Meg | ½ | 502547 | BTS-4.7Meg | |
| R7 | 270Ω | ½ | 502127 | BTS-270 | |
| R8 | 330Ω | ½ | 502133 | BTS-330 | |
| R9 | 56KΩ | ½ | 502356 | BTS-56K | |
| R10 | 4.7Meg | ½ | 502547 | BTS-4.7Meg | |
| R11 | 10Meg | ½ | 502610 | BTS-10Meg | |

| ITEM No. | RATING | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|
| | OHMS | WATT | RCA Victor PART No. | IRC PART No. | |
| R12A | 4.7Meg | ½ | ♦100081 | BTS-4.7Meg | |
| B | 1Meg | ½ | | BTS-1Meg | |
| C | 2.2Meg | ½ | | BTS-2.2Meg | |
| R13 | 1800Ω | ½ | 502218 | BTS-1800 | |
| R14 | 27Ω | ½ | 502027 | BTS-27 | |
| R15 | 3300Ω | ½ | 502233 | BTS-3300 | |
| R16 | 1200Ω | 4 | 100146 | 1 3/4A-1200 | |
| R17 | 1200Ω | 4 | 100146 | 1 3/4A-1200 | |
| R18 | 22Ω | ½ | 502022 | BTS-22 | |
| R19 | 47Ω | 1 | 512027 | BTA-47 | |

♦ Items C7A, C7B, C7C, R12A, R12B, R12C are combined in one unit.

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | RCA Victor PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 9. 8KΩ | 3. 5Ω | 100073 | | A-2927① | A-3329① | 24S49 ① | S-11X ① | ① Bend mounting tabs down, file out slots, mount on original mounting brackets. |

## SPEAKER

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | RCA Victor PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3. 5Ω | 79696 | 4A07 | |

## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | PRI. | SEC. | RCA Victor PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | |
| L1 | Ant. Coil | . 8Ω | | 100086 | | | | |
| L2 | Osc. Coil | 1. 4Ω | 9Ω | 79766 | 14-1040 | BC-387* | 71-Osc. | |
| L3 | Input IF | 25Ω | 25Ω | 100075 | 16-6758 | BC-352 | 12-C1 | |
| L4 | Output IF | 25Ω | 25Ω | 100076 | 16-6770 | BC-355 | 12-C6 | |

* Do not use tapped winding.

## SELENIUM RECTIFIER

| ITEM No. | RATING | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | CURRENT | RCA Victor PART No. | FEDERAL PART No. | INTERNATIONAL PART No. | MALLORY PART No. | RADIO RECEPTOR PART No. | SARKES TARZIAN PART No. | |
| M1 | . 057A | 77292 | 1263A | RS65 | 6S65 | 8J1 | 65 | |

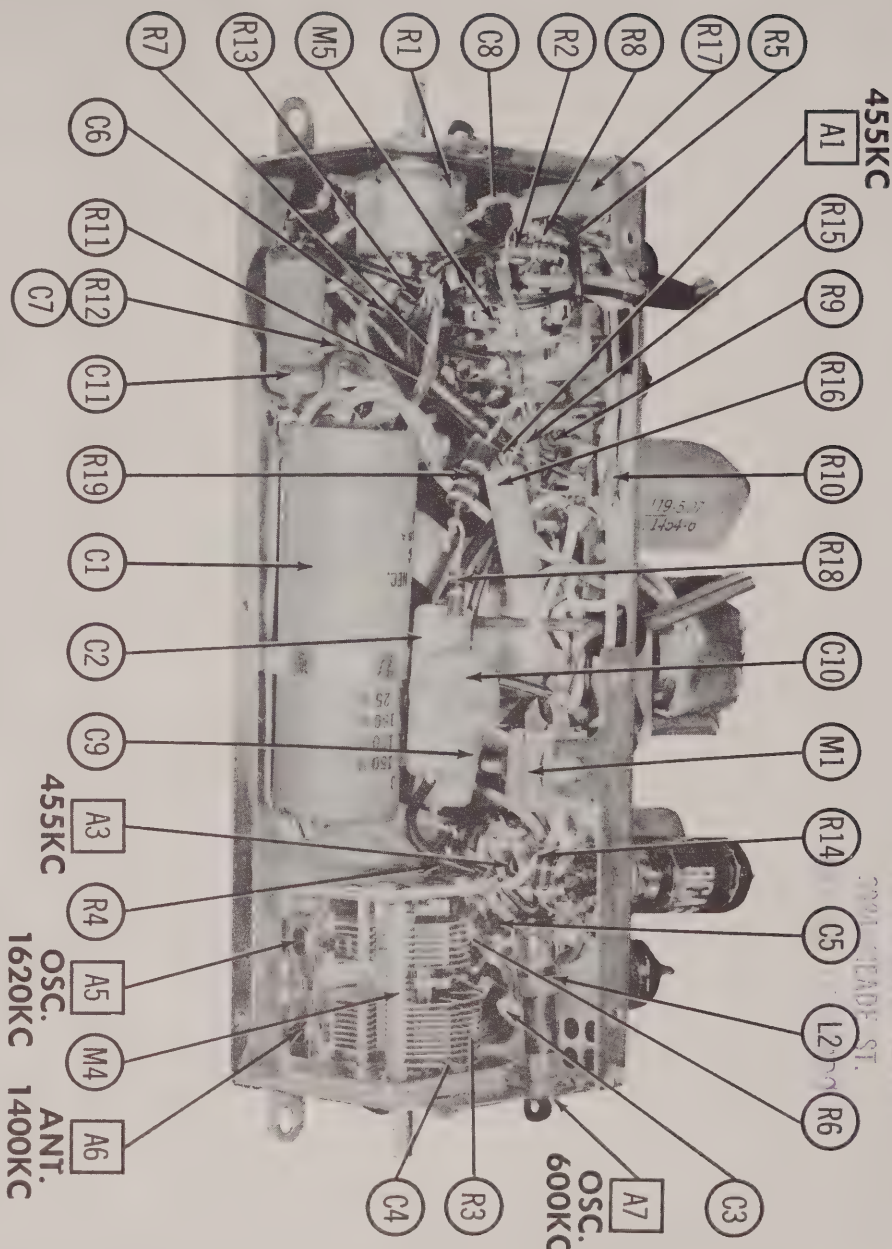
## BATTERIES

| ITEM No. | VOLTAGE | RCA Victor PART No. | REPLACEMENT DATA | | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | EVEREADY | | | BURGESS | | | |
| | | | "A" | "B" | "A-B" | "A" | "B" | "A-B" | |
| M2 | 3V"A" | VS036 | 950 | | | 2R | | | Connect 2 in series. |
| M3 | 67. 5V "B" | VS216 | | 477 | | | P45 | | |

## MISCELLANEOUS

| ITEM No. | PART NAME | RCA Victor PART No. | NOTES |
|---|---|---|---|
| M4 | Tuning Cap. | 100072 | 2 Gang (19-275MMF, 13-90MMF) |
| M5 | Switch | 100080 | Power Changeover (6 Pole-2 Position) |
| | Case | 100137 | Back-Model 6-BX-5 |
| | Case | 100138 | Back-Model 6-BX-6A |
| | Case | 100139 | Back-Model 6-BX-6B |
| | Case | 100140 | Back-Model 6-BX-6C |
| | Case | 100132 | Front-Model 6-BX-5 |
| | Case | 100133 | Front-Model 6-BX-6A |
| | Case | 100134 | Front-Model 6-BX-6B |
| | Case | 100135 | Front-Model 6-BX-6C |
| | Handle | 100092 | Case-Model 6-BX-5 |
| | Handle | 100095 | Case-Model 6-BX-6A |
| | Handle | 100143 | Case-Model 6-BX-6B |
| | Handle | 100093 | Case-Model 6-BX-6C |
| | Knob | 100096 | On-Off-Volume-Model 6-BX-5 |
| | Knob | 100098 | On-Off-Volume-Model 6-BX-6A |
| | Knob | 100099 | On-Off-Volume-Model 6-BX-6B |
| | Knob | 100097 | On-Off-Volume-Model 6-BX-6C |
| | Knob | 100100 | Station Selector-Model 6-BX-5 |
| | Knob | 100102 | Station Selector-Model 6-BX-6A |
| | Knob | 100103 | Station Selector-Model 6-BX-6B |
| | Knob | 100101 | Station Selector-Model 6-BX-6C |

# CHASSIS—BOTTOM VIEW

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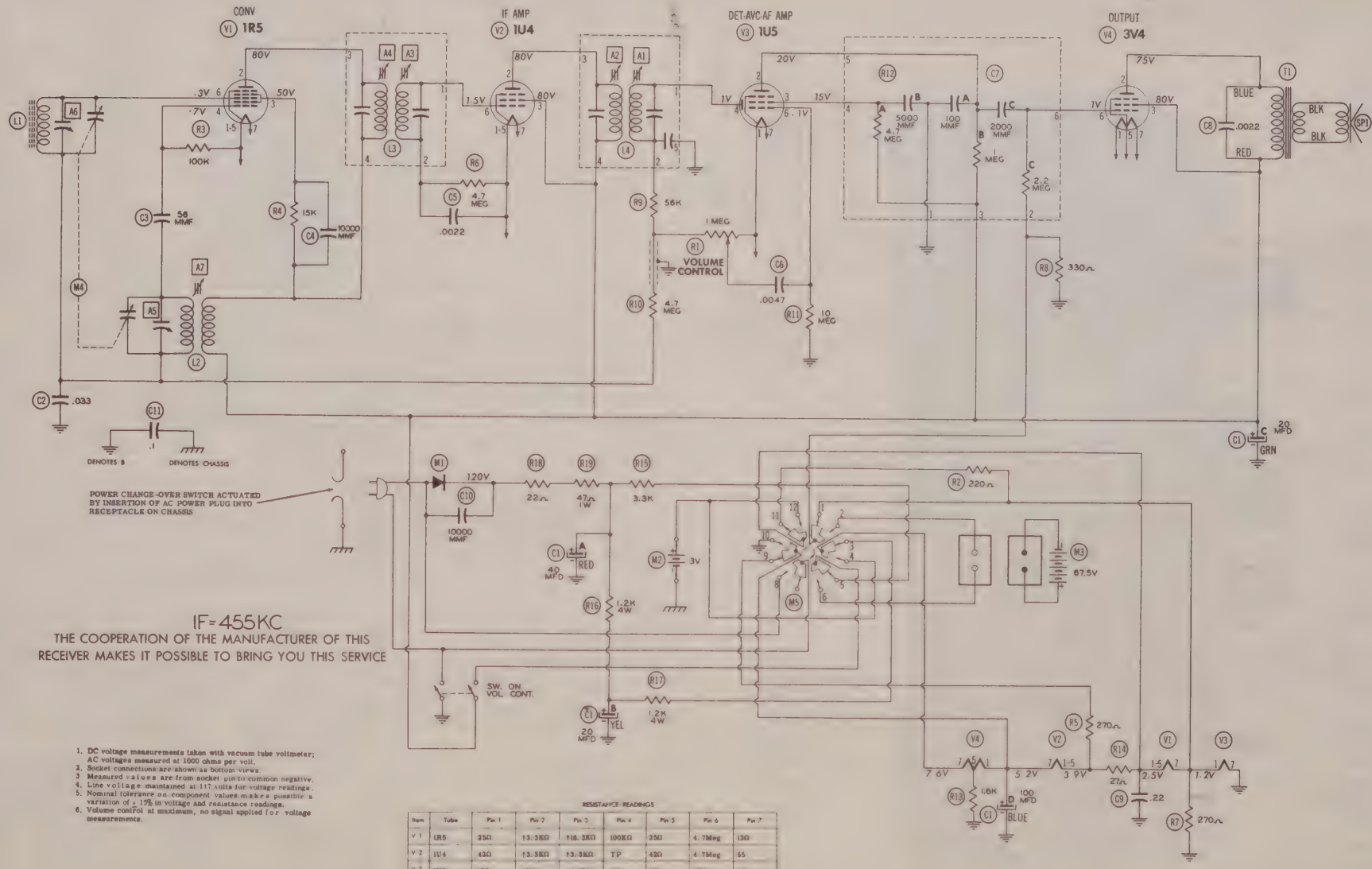


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V 1 | 1R5 | 25Ω | †3.5KΩ | †18.3KΩ | 100KΩ | 25Ω | 4.7Meg | 12Ω |
| V 2 | 1U4 | 42Ω | †3.5KΩ | †3.3KΩ | TP | 42Ω | 4.7Meg | 55 |
| V 3 | 1U5 | 12Ω | †1Meg | †4.7Meg | 1Meg | NC | 10Meg | 0Ω |
| V 4 | 3V4 | 55Ω | †3.7KΩ | †3.3KΩ | NC | 65Ω | 2.2Meg | 75Ω |

†MEASURED FROM OUTPUT OF M1.
TP-TIE POINT.
NC-NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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DENVER, COLORADO

MODEL 1U-1001B

SENTINEL MODELS 1U-1001B,
1U-1011B, 1U-1017B, 1U-1034B

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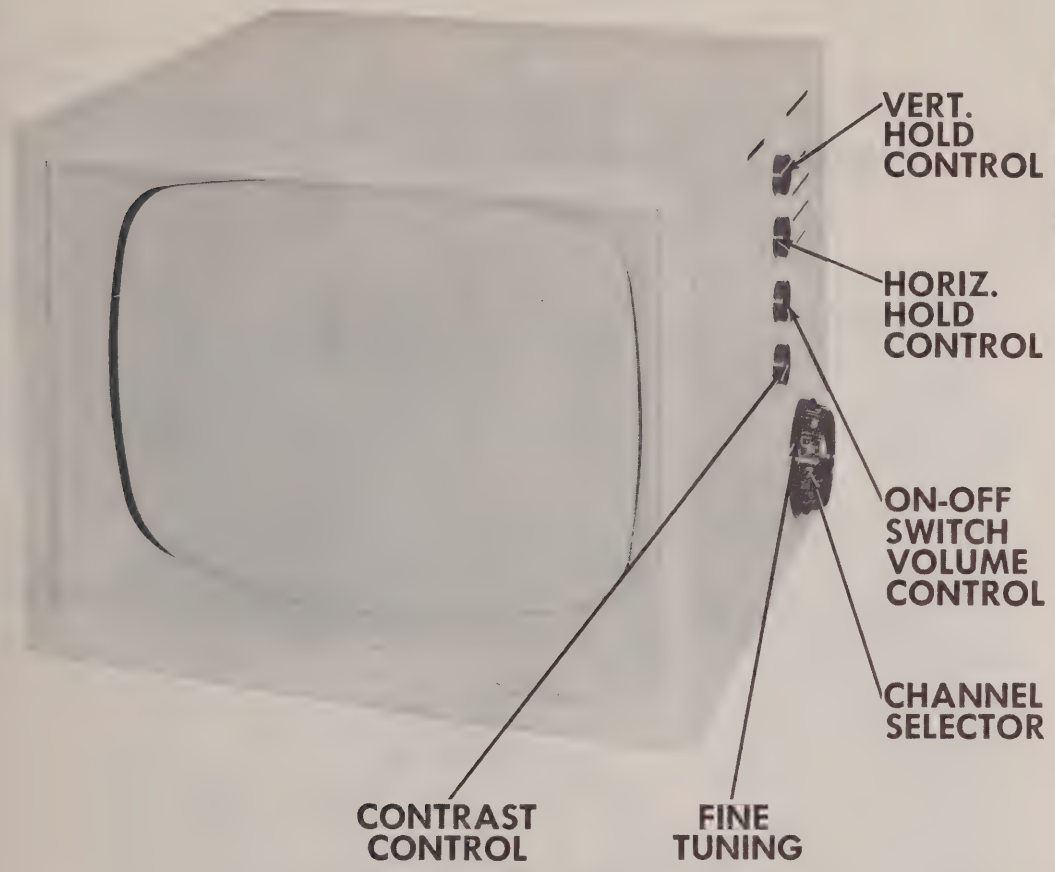
DATE 12–55 SET 299 FOLDER 8

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L. F. [illegible] TEMP
[illegible] MAIN ST.
[illegible] COLORADO

SENTINEL MODEL 1U-1001B

| | |
|---|---|
| TRADE NAME | Sentinel Models 1U-1001B, 1U-1011B, 1U-1017B, 1U-1034B |
| MANUFACTURER | Sentinel Radio Corp., 2100 W. Dempster, Evanston, Illinois |
| TYPE SET | Television Receiver |
| TUBES | Fifteen |
| POWER SUPPLY | 110-120 Volts AC-60 Cycle RATING 1.24 Amp. @ 117 Volts AC |
| TUNING RANGE | Channels 2 thru 13, Video IF 26.4MC, Sound IF 21.9MC (Intercarrier) |

## INDEX

Alignment Instructions ..... 6, 7
Disassembly Instructions ..... 18
Horizontal Sweep Circuit Adjustments ..... 11
Parts List and Descriptions ..... 14, 15, 16
Photographs
Cabinet-Rear View ..... 11
Capacitor Identification ..... 4, 9
Chassis-Top View ..... 3
Chassis-Rear View ..... 13
RF Tuner ..... 10
Photographs (Cont)
Resistor Identification ..... 19, 20
Trans., Inductor & Alignment Identification ..... 13
Resistance Measurements ..... 8
Servicing in the Field ..... 18
Schematic ..... 2
Trouble Shooting Aids ..... 12, 17
Tube Failure Check Chart ..... 5
Tube Placement Chart (Bottom View) ..... 8
Tube Placement Chart (Top View) ..... 5

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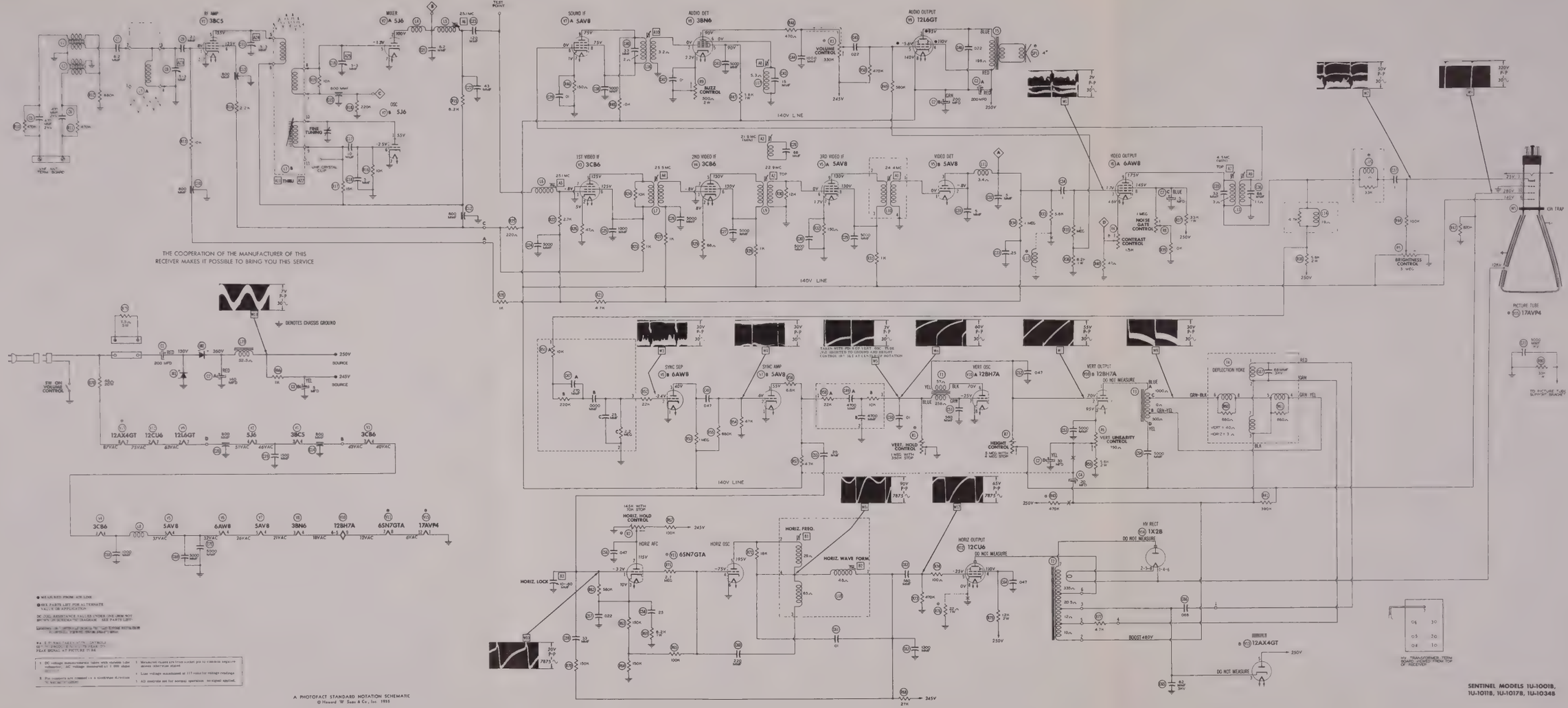
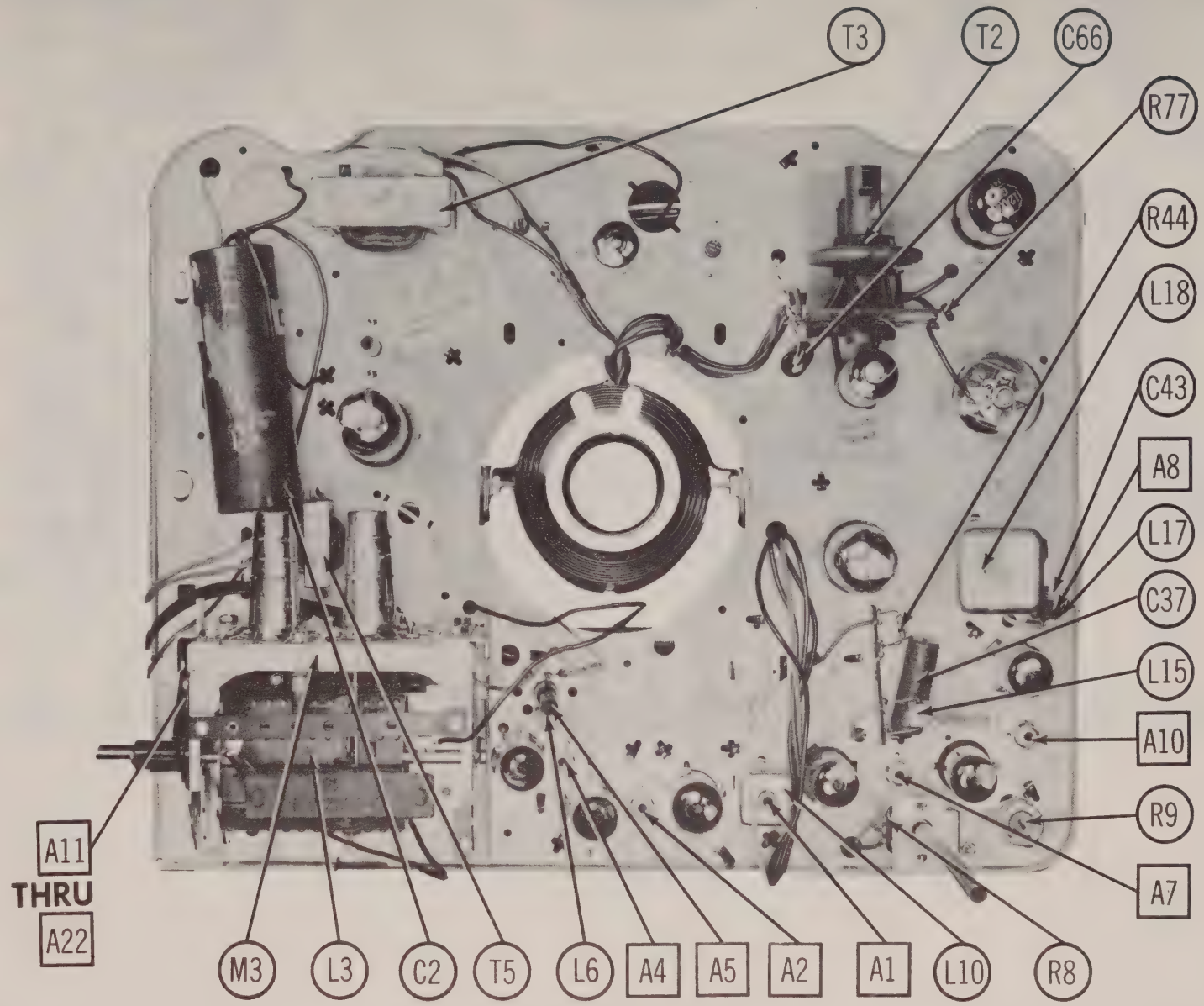
SENTINEL MODELS 1U-1001B, 1U-1011B, 1U-1017B, 1U-1034B

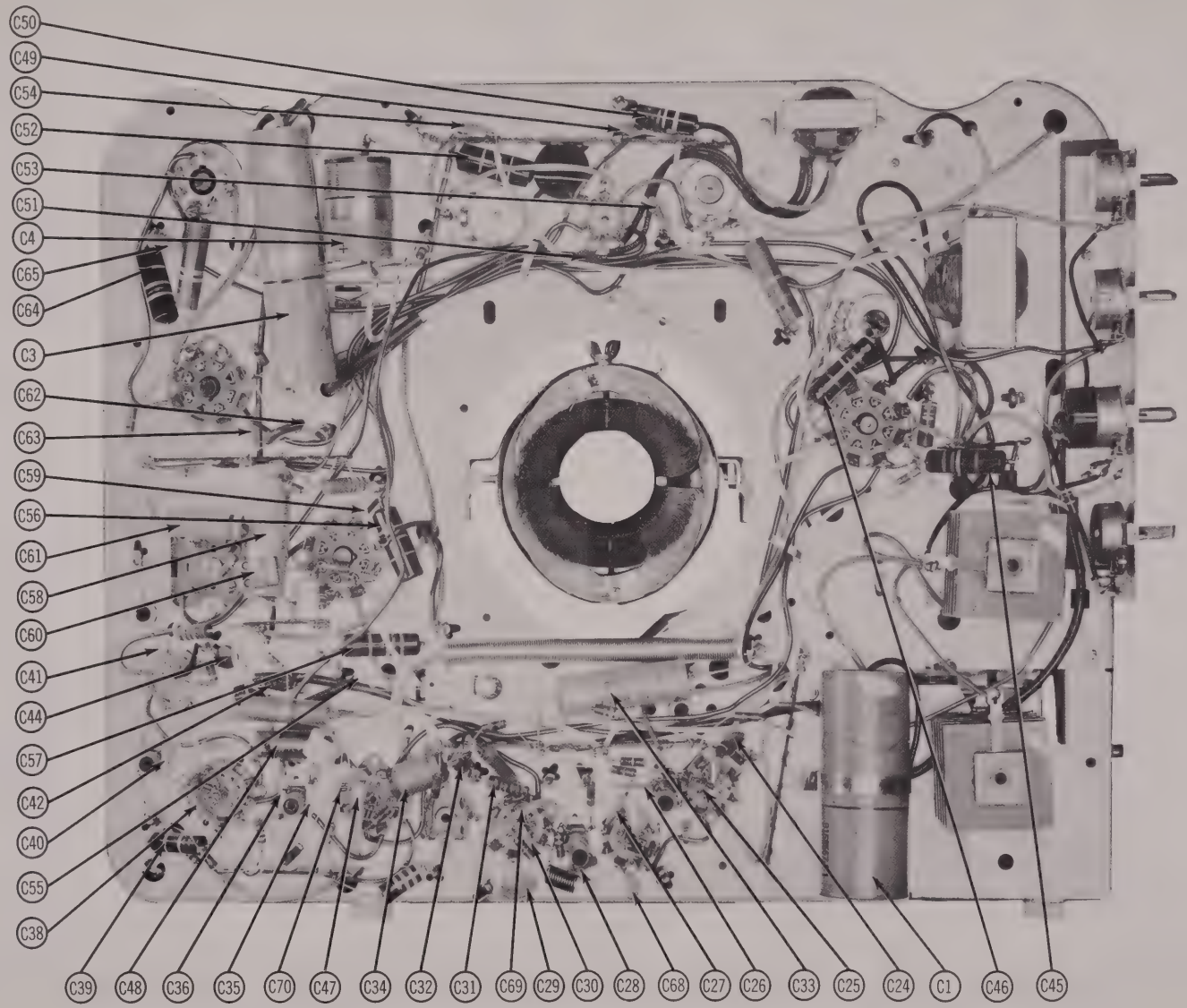



SENTINEL MODELS 1U-1001B, 1U-1011B, 1U-1017B, 1U-1034B



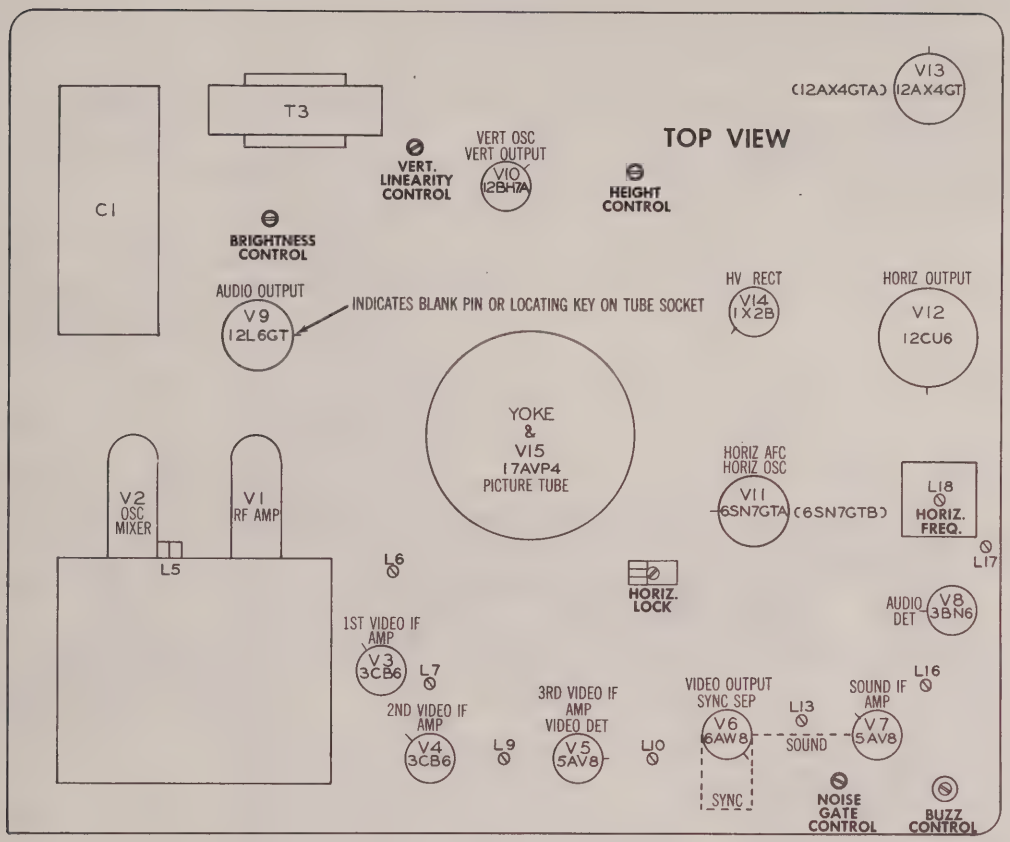

CHASSIS TOP VIEW

SENTINEL MODELS 1U-1001B, 1U-1011B, 1U-1017B, 1U-1034B




CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

# TUBE PLACEMENT CHART




# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

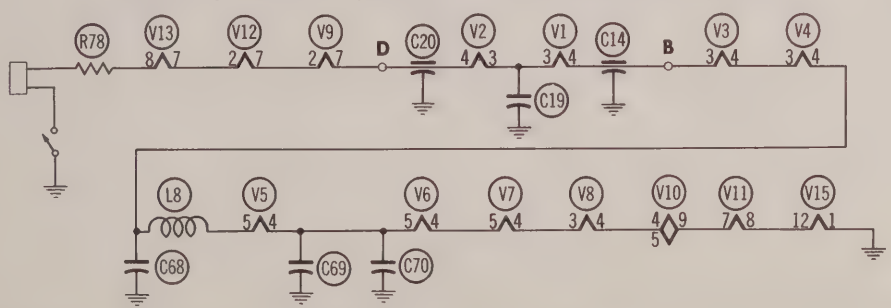
POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V15
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V7, V10
No horiz. sync - V7, V11
No vert. or horiz. sync - V6, V7

SWEEP FAILURE
No raster, has sound - V11, V12, V13, V14, V15
No vertical deflection - V10
Poor vert. linearity or foldover - V10
Poor horiz. linearity or foldover - V11, V12, V13
Narrow picture - V11, V12, V13, V14, M1, M2
Vert. off freq. - V7, V10
Horiz. off freq. - V7, V11

Note: Since this receiver employs tubes used in a series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative. (See circuit below).

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# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis.

**VIDEO IF ALIGNMENT**

Attenuate the generator output to maintain approximately-2 volts on VTVM unless another value is specified.
Connect the negative lead of a 3 volt battery to the tuner AGC (white) lead.
Connect positive lead to chassis.
Set the channel switch between any two channels. This will disable the local oscillator and reduce the possibility of erroneous indications.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | .01MFD | High side to point Ⓑ. Low side to chassis. | 24.4MC (Unmod) | Between any two channels | DC probe to point Ⓐ. Common to chassis. | A1 | Adjust for maximum deflection. |
| 2. | " | " | 22.9MC | " | " | A2 | Adjust for maximum deflection. If two peaks occur, use the peak nearest clip end of coil. |
| 3. | " | " | 21.9MC | " | " | A3 | Adjust for MINIMUM deflection. Use enough generator output to produce .5 volts deflection at MINIMUM reading. Use the null obtained with the core farthest from clip end of coil. Repeat steps 2 and 3. |
| 4. | " | " | 25.5MC | " | " | A4 | Adjust for maximum deflection. |
| 5. | " | " | 25.1MC | " | " | A5 | Adjust for maximum deflection. Use peak nearest clip end of coil. |
| 6. | " | High side to point Ⓒ. Low side to chassis. | " | " | " | A6 | Shunt L6 with 100Ω resistor in series with .001MFD capacitor. Adjust A6 for maximum deflection. Remove 100Ω resistor and .001MFD capacitor from L6. |

**OVERALL VIDEO IF RESPONSE CHECK**

Leave bias connected as under "Video IF Alignment". Use only enough sweep generator output for useable pattern on scope.
Set contrast control for minimum contrast.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | Direct | High side to an ungrounded tube shield floating over converter tube. Low side to chassis. | 24MC (10MC Swp) | 21.9MC<br>22.9MC<br>25.1MC<br>25.5MC<br>26.4MC | Between any two channels | Vert. Amp. thru 10KΩ to point Ⓓ. Low side to chassis. | | Check for response curve similar to Fig. 1. SLIGHTLY retouch A1 thru A6 to obtain desired response. If desired response cannot be obtained with slight retouching of A1 thru A6, steps 1 thru 6 should be repeated. |

**4.5MC TRAP ALIGNMENT**

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 8. | .01MFD | High side to pin 11 (cathode) of picture tube. Low side to chassis. | 4.5MC (Unmod) | Between any two channels | Connect VTVM. across secondary of sound output transformer | A7 | Adjust for MINIMUM deflection. |

**SOUND IF ALIGNMENT USING ON THE AIR SIGNAL**

Turn the set on and tune in a strong TV signal. Turn the buzz control (R9) 90° from maximum clockwise position. Adjust A8 for maximum volume. Reduce the signal strength. (Remove the antenna from antenna terminals and stray feed the signal by placing antenna near antenna terminals.) Adjust A9 and A10 for maximum volume. Adjust R9 for minimum noise. Reconnect antenna and readjust A8 for maximum volume. If necessary, reduce volume so peak may be heard.

**ALTERNATE SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR, AM SIGNAL GENERATOR AND OSCILLOSCOPE**

Set volume control at a low volume level.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 9. | .01MFD | High side to pin 7 (grid) of 6AW8 (V6A). Low side to chassis. | 4.5MC (400∿Mod) (50KC Swp) | 4.5MC | Between any two channels | Across secondary of sound output transformer | A8 | Set buzz control (R9) 90 degrees from maximum clockwise rotation. Adjust A8 for maximum 400∿ indication on scope. |
| 10. | " | " | " | " | " | " | A10, A9 | Attenuate generator output so that signal is below the limiting level of the 3BN6 as evidenced by background hiss and noise. Adjust A10 and A9 for maximum 400Ω response on scope. |
| 11. | " | " | " | 4.5MC (400∿Mod) | " | " | R9 | Use a high generator output and adjust R9 for MINIMUM 400∿ indication on scope. |
| 12. | " | " | " | 4.5MC | " | " | A8 | With volume control at low level retouch A8 for maximum 400∿ indication on scope. |

# ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
The channel oscillator adjustment screws are reached through a hole just above the channel switch shaft. The correct adjustment screws are accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 13. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 213MC (10MC Swp) | 211.25MC 215.75MC | 13 | Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis | All | Adjust to place sound marker in trap notch as in Fig. 2. Video marker should be at 50%. |
| | | | 207MC (10MC Swp) | 205.25MC 209.75MC | 12 | | A12 | |
| | | | 201MC (10MC Swp) | 199.25MC 203.75MC | 11 | | A13 | |
| | | | 195MC (10MC Swp) | 193.25MC 197.75MC | 10 | | A14 | |
| | | | 189MC (10MC Swp) | 187.25MC 191.75MC | 9 | | A15 | |
| | | | 183MC (10MC Swp) | 181.25MC 185.75MC | 8 | | A16 | |
| | | | 177MC (10MC Swp) | 175.25MC 179.75MC | 7 | | A17 | |
| | | | 85MC (10MC Swp) | 83.25MC 87.75MC | 6 | | A18 | |
| | | | 79MC (10MC Swp) | 77.25MC 81.75MC | 5 | | A19 | |
| | | | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | | A20 | |
| | | | 63MC (10MC Swp) | 61.25MC 65.75MC | 3 | | A21 | |
| | | | 57MC (10MC Swp) | 55.25MC 59.75MC | 2 | | A22 | |

RF AND MIXER ALIGNMENT

Connect bias as under "Video IF Alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 14. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in a each lead. | 207MC (10MC Swp) | 205.25MC 209.75MC | 12 | Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis. | A23, A24, A25 | Adjust for response similar to Fig. 3. |
| 15. | " | " | 213MC (10MC Swp) | 211.25MC 215.75MC | 13 | " | | Check for response similar to Fig. 3. If markers fall below 70% on any channel, make compromise adjustment of A23, A24 and A25 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected. |
| | | | 201MC (10MC Swp) | 199.25MC 203.75MC | 11 | | | |
| | | | 195MC (10MC Swp) | 193.25MC 197.75MC | 10 | | | |
| | | | 189MC (10MC Swp) | 187.25MC 191.75MC | 9 | | | |
| | | | 183MC (10MC Swp) | 181.25MC 185.75MC | 8 | | | |
| | | | 177MC (10MC Swp) | 175.25MC 179.75MC | 7 | | | |
| | | | 85MC (10MC Swp) | 83.25MC 87.75MC | 6 | | | |
| | | | 79MC (10MC Swp) | 77.25MC 81.75MC | 5 | | | |
| | | | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | | | |
| | | | 63MC (10MC Swp) | 61.25MC 65.75MC | 3 | | | |
| | | | 57MC (10MC Swp) | 55.25MC 59.75MC | 2 | | | |

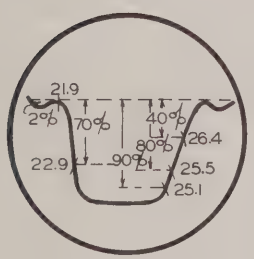


FIG.1

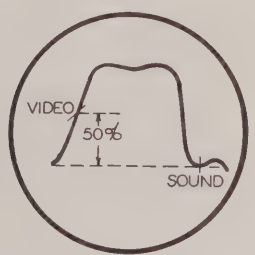


FIG.2

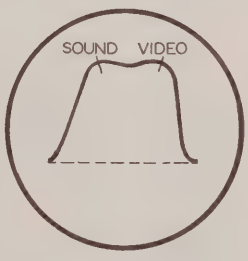
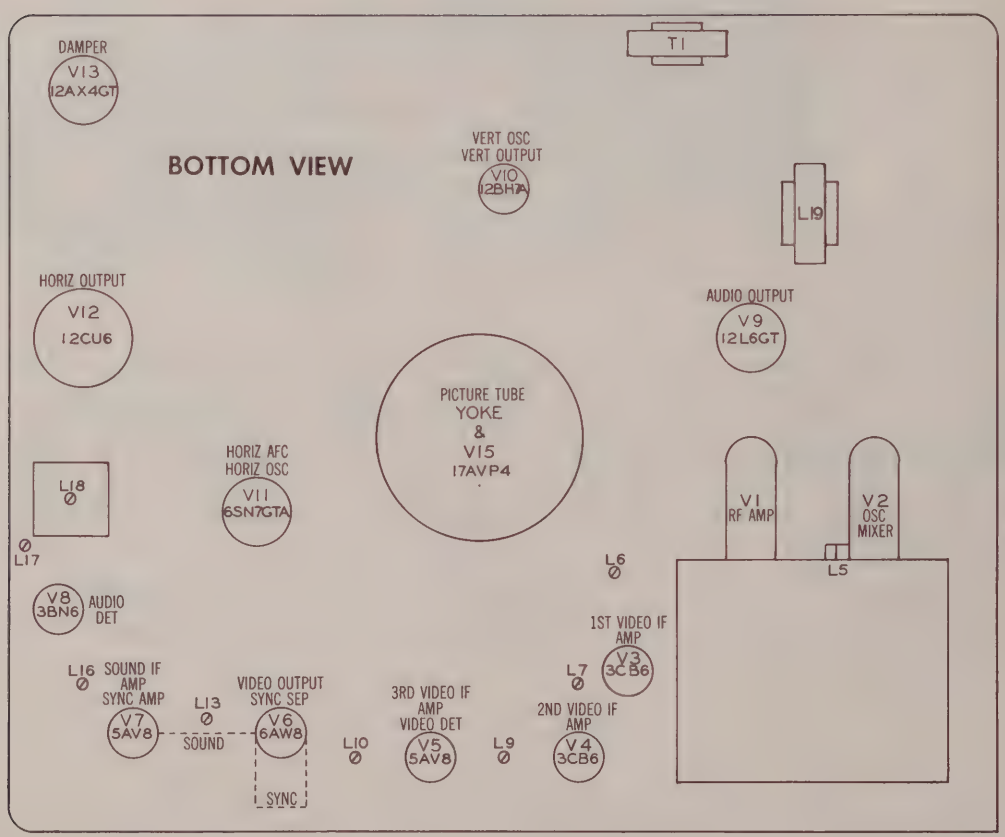


FIG.3

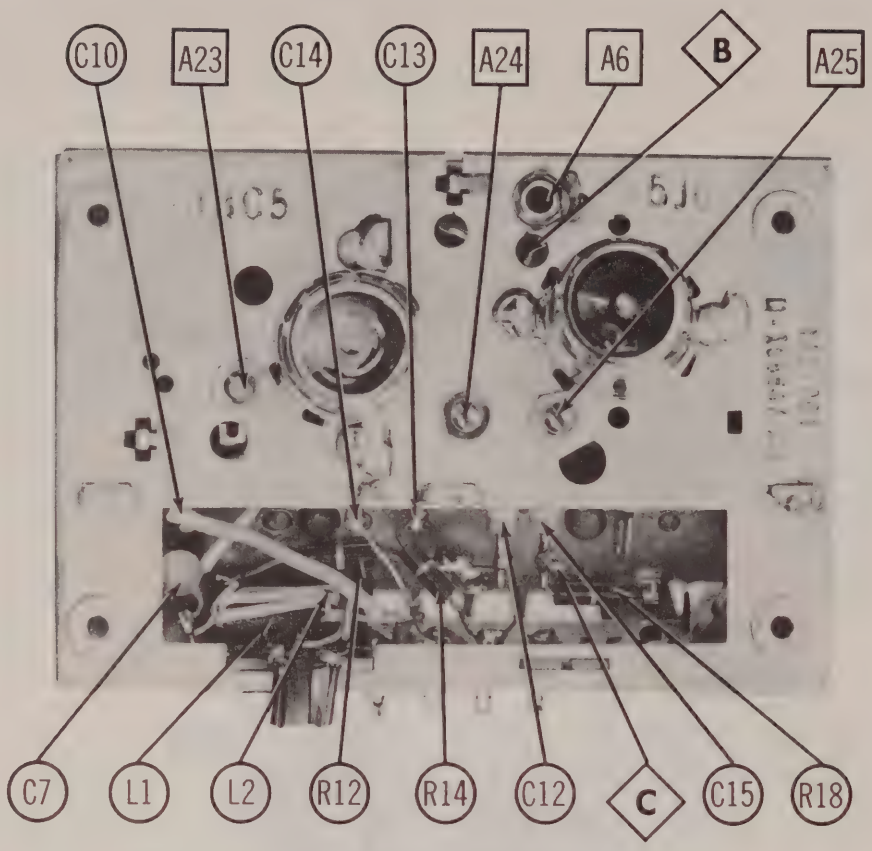
# RESISTANCE MEASUREMENTS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 3BC5 | 1Meg | 0Ω | 12Ω | 11Ω | ■220Ω | ■2. 4KΩ | 0Ω | | |
| V 2 | 5J6 | ■15KΩ | ■8. 4KΩ | 12Ω | 14Ω | 220KΩ | 10KΩ | 0Ω | | |
| V 3 | 3CB6 | 1Meg | 47Ω | 11Ω | 10Ω | ■1. 2KΩ | ■1. 2KΩ | 0Ω | | |
| V 4 | 3CB6 | 1Meg | 68Ω | 10Ω | 9Ω | ■1KΩ | ■1KΩ | 0Ω | | |
| V 5 | 5AV8 | . 5Ω | 5. 6KΩ | 5. 6KΩ | 8Ω | 9Ω | . 3Ω | 150Ω | ■1KΩ | ■1KΩ |
| V 6 | 6AW8 | 0Ω | 2. 2Meg | ■1Meg | 7Ω | 8Ω | 300Ω | 1Meg | †33KΩ | †5. 6KΩ |
| V 7 | 5AV8 | 0Ω | 47KΩ | ■11. 5KΩ | 6Ω | 7Ω | 1. 1Ω | 150Ω | ■10KΩ | ■10KΩ |
| V 8 | 3BN6 | 250Ω | 3. 2Ω | 6Ω | 5Ω | ■5. 6KΩ | 5. 3Ω | †330KΩ | | |
| V 9 | 12L6GT | NC | 17Ω | †250Ω | †53Ω | 280KΩ | TP | 14Ω | 130KΩ | |
| V 10 | 12BH7A | ▲1KΩ | ▲2Meg | 6. 5KΩ | 5Ω | 5Ω | ▲2Meg | 700KΩ | 0Ω | 3Ω |
| V 11 | 6SN7GTA | 750KΩ | †90KΩ | 300KΩ | 250KΩ | †28KΩ | 0Ω | 3Ω | 2Ω | |
| V 12 | 12CU6 | NC | 20Ω | TP | †12KΩ | 470KΩ | TP | 17Ω | 0Ω | TOP CAP ▲20. 5Ω |
| V 13 | 12AX4GT | NC | NC | 1Meg | NC | †53Ω | NC | 20Ω | 22Ω | |
| V 14 | 1X2B | | PINS | 1-8 | HAVE | INF | RESISTANCE | | | TOP CAP ▲355Ω |
| V 15 | 17AVP4 | 0Ω | 0Ω | PIN 6 130KΩ | PIN 10 ▲390KΩ | PIN 11 ■350KΩ | PIN 12 2Ω | | | |

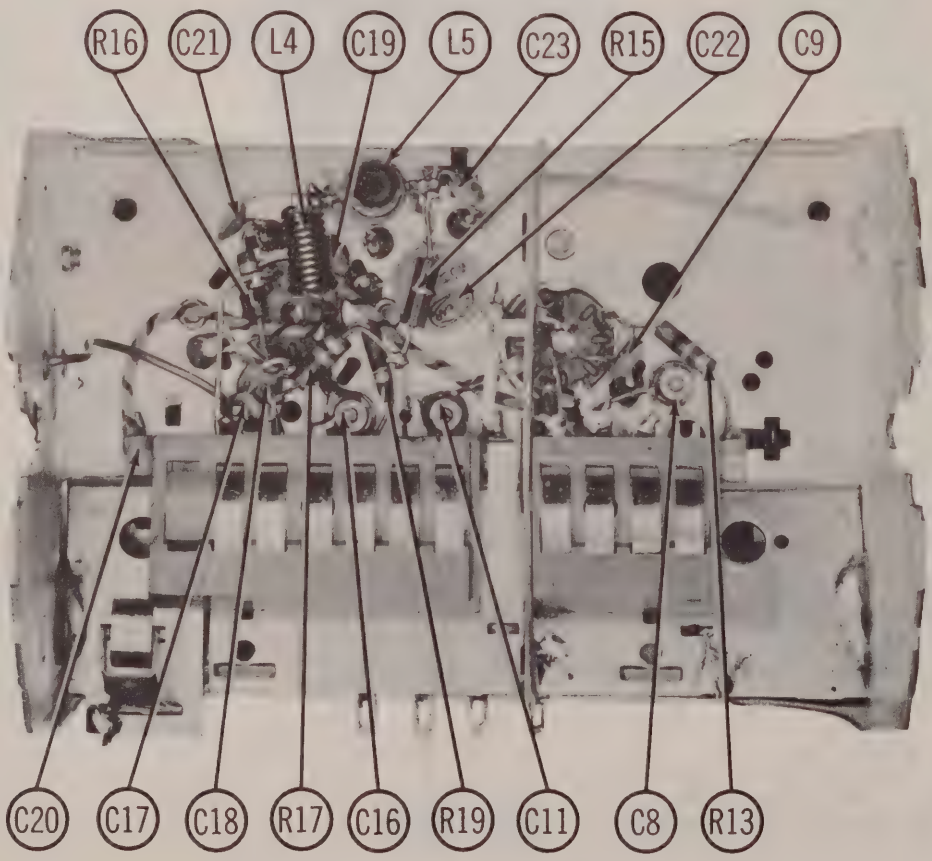
■MEASURED FROM 140 V LINE.
†MEASURED FROM OUTPUT OF M2.
▲MEASURED FROM PIN 3 OF V13.
NC-NO CONNECTION.
TP-TIE POINT.



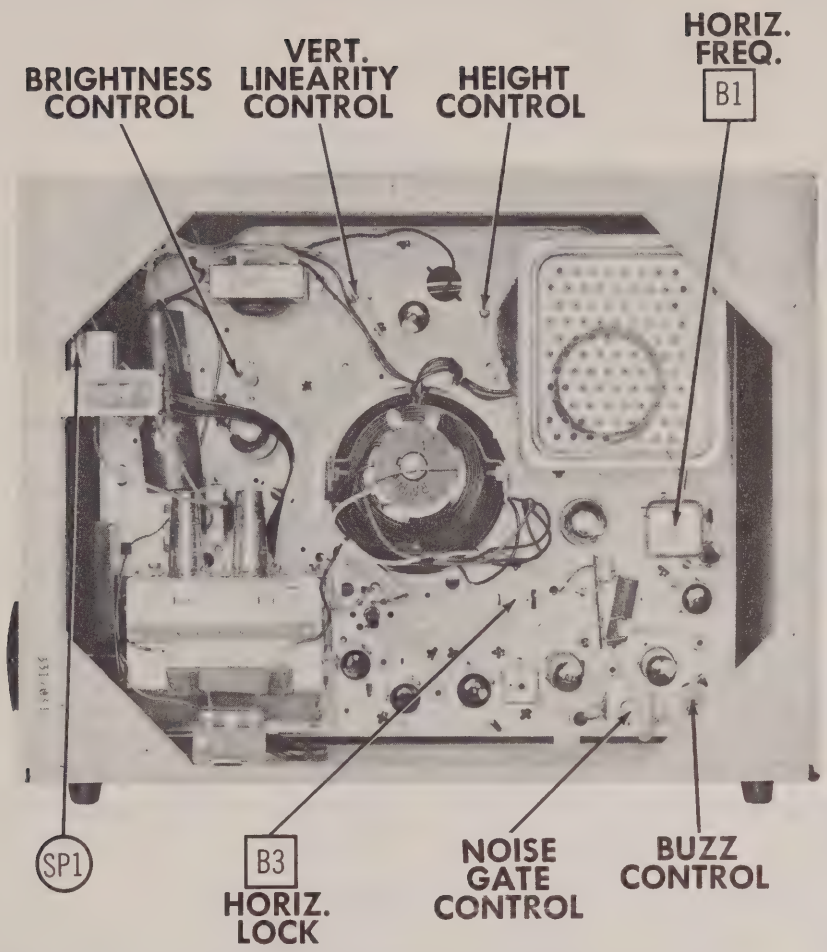

# TUBE PLACEMENT CHART




**RF TUNER-TOP VIEW**




**RF TUNER-BOTTOM VIEW**




CABINET—REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Set contrast control for normal contrast.

1. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

2. Connect the vertical amplifier of an oscilloscope thru 10MMF to lug 4 of L18. Connect the low side to chassis. Adjust the horizontal waveform slug (B2) until waveform similar to Fig. 4 is obtained. While making this adjustment keep the picture in sync with the horizontal hold and if necessary, B1 and the horizontal lock trimmer (B3).

3. Turn the horizontal hold control fully clockwise and remove scope from L18. Turn B1 counter clockwise until the picture just loses sync, then turn B1 clockwise until picture is just ready to pull-in.

4. Turn the horizontal hold control fully counter clockwise. Picture should remain in sync. Momentarily remove the signal by switching off channel and back again. If more than seven bars are present adjust B3 slightly counter clockwise until 3 or 4 bars appear when switching off channel and back again. If less than 3 bars are present when switching off channel and back again, adjust B3 slightly clockwise and check by switching off channel and back again.

Repeat steps 3 and 4 until the effective pull-in range of the horizontal hold control is from 60 to 120 degrees.

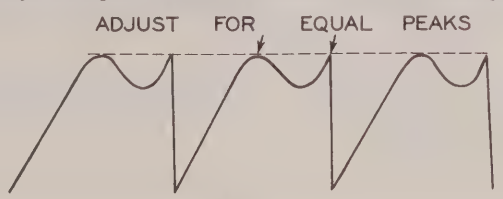



FIG. 4

# TROUBLE SHOOTING AIDS

## SWEEP

### HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V12 and V13. Check M1 and M2. Check C62, C63, T2, T4A, R75, R79 and other associated components.

DRIVE LINES

Check by substitution V12 and V13. Check R68, R75, R79, C62, C63, T2, T4A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V12 and V13. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V11, V12 and V13. Check C57 and C58 for open. Check L18, R69, R67, R2 and other associated components.

XMAS TREE EFFECT

Check by substitution V11, V12 and V13. Check T2 and T4 for internal arcing. Check L18, C59, C60, C61, R72, R68 and other associated components.

### VERTICAL

LOSS OF SWEEP

Substitute V10. Check waveform W7.

| If Satisfactory | If Unsatisfactory |
|---|---|
| Check T3, T4B, C53, R59, R6 and other associated components. | Check T1, C51, C52, R7, R1 and other associated components. |

INSUFFICIENT SWEEP

Substitute V10. Check height and vertical linearity controls for proper operation and other associated components.

COMPRESSED AT BOTTOM

Substitute V10. Check T1, C52, R7, R41 and other associated components.

COMPRESSED AT TOP

Substitute V10. Check C53, R59, R6, T3 and other associated components.

FOLDS

Substitute V10. Check T1, T3, T4B, C52, R59 and other associated components.

## SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V6 and V7. Check C47, C48, R53, R56, R57 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V10. Check vertical integrator network. Check T1, C50, C51, R1 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Substitute V11. Check C55, C57, C58, R69, R67, L18 and other associated components.

HORIZONTAL BENDING

Check by substitution V6, V7 and V11. Check components associated with V11.

## VIDEO

LOSS OF VIDEO

Substitute V6. Check C34, C37, C2C, R37, R38 and other associated components.

SOUND BARS (4.5 MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A7. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check contrast control. Check C34, C37, R37, R38, R40, L14, L15 and other associated components.

NEGATIVE PICTURE

Substitute V6. Check picture tube. Check C34, C37, L15 and other associated components.

SMEAR

Substitute V6. Check L11, L12, L14, L15, C34, C37 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

## AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8 and V9. Check stage V9 using audio signal generator. Apply audio signal across C44.

| If Satisfactory | If Unsatisfactory |
|---|---|
| Check audio detector and audio IF stages for component failure or change of value. | Check C44, C45, C46, R48, R49, R50, T5 speaker and other associated components. |

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustments R9 and A8 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or no Sound".

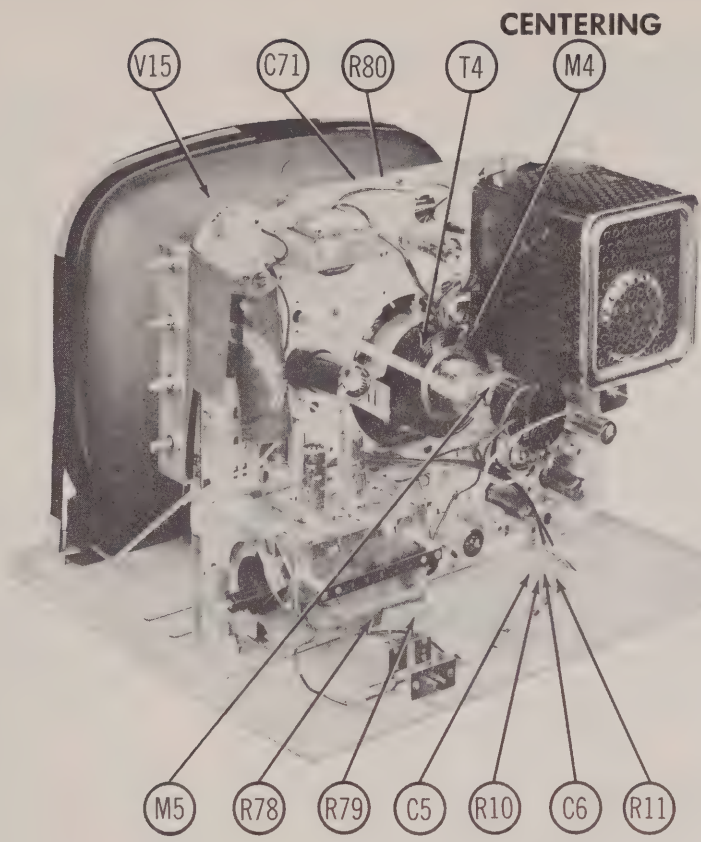
## POWER

DEAD SET

If filaments fail to light, check all tubes. These tubes are connected in series. Check AC interlock assembly. Check switch on volume control and R78. If filaments light, check M1, M2, R79 and C1. Check B+ filter and decoupling network.

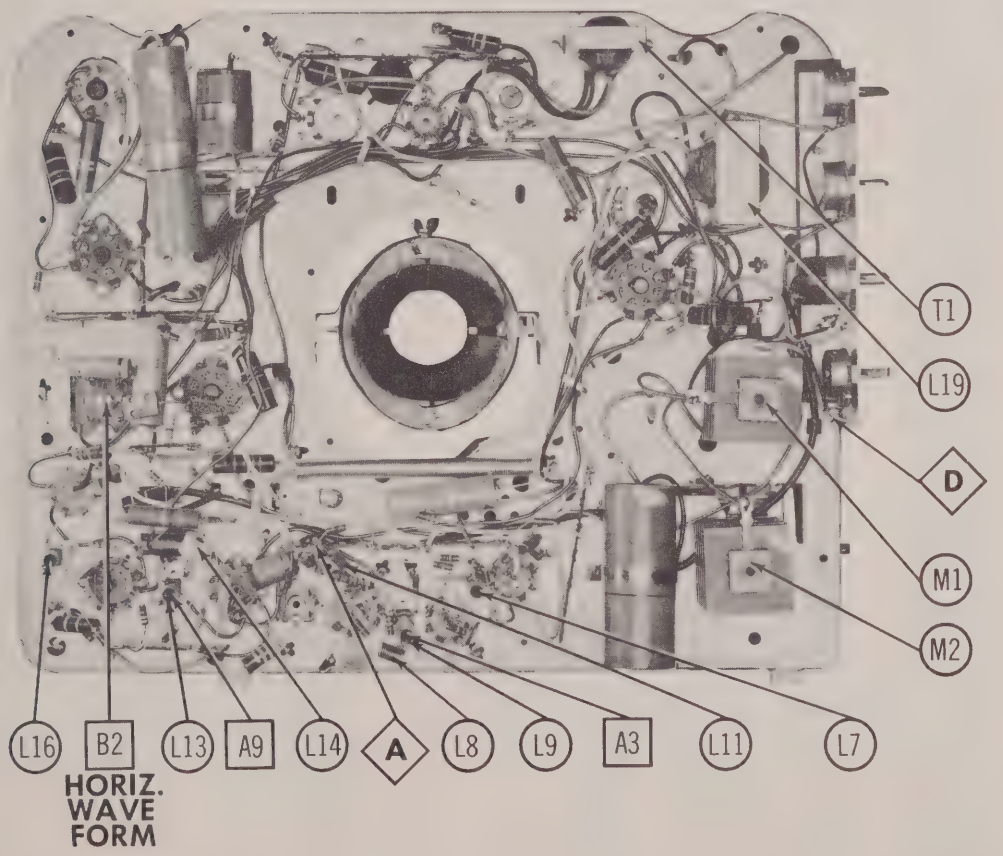
SMALL AND/OR DIM PICTURE

Check M1, M2, R79 and C1. Check B+ filter and decoupling network.




PROPERTY OF
F. E. HAWKINSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS REAR VIEW




CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No | USE | REPLACEMENT DATA: SENTINEL PART No. | STANDARD REPLACEMENT | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | RF Amp. | 3BC5 | 3BC5 | 7BD | |
| V2 | Mixer-Osc. | 5J6 | 5J6 | 7BF | |
| V3 | 1st Video IF Amp. | 3CB6 | 3CB6 | 7CM | |
| V4 | 2nd Video IF Amp. | 3CB6 | 3CB6 | 7CM | |
| V5 | 3rd Video IF Amp. - Video Det. | 5AV8 | 5AV8 | 9DZ | |
| V6 | Video Output Sync Sep. | 6AW8 | 6AW8 | 9DX | |
| V7 | Sound IF Amp. - Sync Amp. | 5AV8 | 5AV8 | 9DZ | |
| V8 | Audio Det. | 3BN6 | 3BN6 | 7DF | |
| V9 | Audio Output | 12BL6GT | 12BL6GT | 7AC | |
| V10 | Vert. Osc. - Vert. Output | 12BH7A | 12BH7A | 9A | |
| V11 | Horiz. AFC-Horiz. Osc. | 6SN7GTA | 6SN7GTA | 8BD | 6SN7GTB used as an alternate. |
| V12 | Horiz. Output | 12CU6 | 12CU6 | 6AM | |
| V13 | Damper | 12AX4GT | 12AX4GT | 6CG | 12AX4GTA used as an alternate. |
| V14 | HV Rect. | 1X2B | 1X2B | 9Y | |

## CATHODE-RAY TUBE

| ITEM No. | REPLACEMENT DATA: SENTINEL PART No. | CBS PART No. | GENERAL ELECTRIC PART No. | SYLVANIA PART No. | WESTINGHOUSE PART No. | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|---|---|
| V15 | 17AVP4 | 17AVP4 | | 17AVP4 | | 12L | ① Aluminized |
| | | 17AVP4A ① | | 17AVP4A ② | | 12L | ② Silver Screen |
| | 21ATP4 | 21ATP4 | | 21ATP4 ② | 21ATP4 | 12L | |
| | | | 21ATP4A ① | | | 12L | |
| | 24DP4A ① | 24DP4A ① | 24DP4A ① | 24DP4A ② | 24DP4A ① | 12L | |
| | | | | 24DP4 | 24DP4 | 12L | |

## ELECTROLYTIC CAPACITORS

| ITEM No | RATING: CAP | VOLT | REPLACEMENT DATA: SENTINEL PART No. | MALLORY PART No. | PYRAMID PART No. | SANGAMO PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C1 | 200 | 200 | | WS342 | TD-200-200 | D-100 | |
| C2A | 140 | 350 | | | CDB-1008 | Q-183 | |
| B | 200 | 200 | | | | T-110 | |
| C | 5 | 300 | | | | | |
| D | 30 | 150 | | | | | |
| C3A | 200 | 150 | B157836-1-3 | WD345 | TDL-205 | D-088 | |
| B | 5 | 150 | | | | | |
| C4 | 20 | 450 | B157903-1-2 | TC75 | TD-20-450 | FM-4520 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.**

| ITEM No | RATING: CAP | VOLT | REPLACEMENT DATA: SENTINEL PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C5 | 470 | 2000 | B15620I-1-1 | DD30-471 | 3KV-471 | DC30347 | |
| C6 | 470 | 2000 | B15620I-1-1 | DD30-471 | 3KV-471 | DC30347 | |
| C7 | 8.2 | | 13L8C8R2D | | NPOA-8R2 | | |
| C8 | .5-3 | | 31A-056-1 | 829-3 | 31I5-01-0R5 | CT585A | |
| C9 | 120 | | 13L8V12IK | DD-121 | 81I-121 | UC-5312 | |
| C10 | 800 | | SA-1050 | | | | |
| C11 | .5-3 | | 31A-056-1 | 829-3 | 31I5-01-0R5 | CT585A | |
| C12 | 800 | | SA-1050 | | | | |
| C13 | 800 | | SA-1050 | | | | |
| C14 | 800 | | SA-1050 | | | | |
| C15 | 800 | | SA-1050 | | | | |
| C16 | .5-3 | | 31A-056-1 | 829-3 | 31I5-01-0R5 | CT585A | |
| C17 | 10 | | 13L8U100A | TCN-10 | N750K-100 | NT-541 | |
| C18 | 5 | | 13L8UA050C | | | | |
| C19 | 1500 | | SA-1051 | DD-152 | 80I-0015 | DC-5315 | |
| C20 | 800 | | SA-1050 | | | | |
| C21 | 8.2 | | 13L8C8R2D | | NPOA-8R2 | | |
| C22 | 43 | | 13L16C430J | TCZ-43 | NPOL-430 | | |
| C23 | 120 | | 13L8V12IK | DD-121 | 81I-121 | UC-5312 | |
| C24 | 5000 | | 33E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C25 | 1000 | | 33E4004-5 | DD-302 | 80I-001 | DC-521 | |
| C26 | 5000 | | 33E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C27 | 5000 | | 33E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C28 | 68 | 500 | C137499-33 | D6-681 | 80I-680 | | |
| C29 | 5000 | | 33E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C30 | 5000 | | 33E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C31 | 5 | | D137727-103 | D6-050 | GPIK-050 | ZT-555 | |
| C32 | 5 | | D137727-103 | D6-050 | GPIK-050 | ZT-555 | |
| C33 | .25 | 25 | A157810-1-1 | | | PT4025 | |
| C34 | .1 | 150 | A157905-1-1 | DF-104 | | PT401 | |
| C35 | 33 | | D137727-126 | | | | |
| C36 | 68 | | D137727-133 | | | | |
| C37 | .1 | 400 | 33E3416 | DF-104 | | PT401 | |
| C38 | 5000 | | 33E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C39 | .01 | 400 | 33E3410 | D6-103 | GP3-333-103 | PT411 | |
| C40 | 33 | | D137727-126 | | | | |
| C41 | 5000 | | 33E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C42 | .01 | 400 | 33E3410 | D6-103 | GP3-333-103 | PT411 | |
| C43 | 15 | | D137727-43 | | | | |
| C44 | 1000 | | 33E4004-5 | DD-102 | 80I-001 | DC-521 | |
| C45 | .022 | 200 | 33E3412 | DF-203 | 81Y-03 | PT4122 | |
| C46 | .022 | 200 | 33E3412 | DF-203 | 81Y-03 | PT4122 | |
| C47A | 270 | | | | GP2K-271 | UC-5327 | |
| B | 10000 | | †A157813-1-3 | †PC-263 | 81I-01 | DC-511 | |
| C | 25 | | | | GPIK-250 | UC-5425 | |
| C48 | .047 | 200 | 33E3414 | DF-503 | | PT4147 | |
| C49A | 4700 | | ▪A157812-1-2 | ▪PC-106 | 81I-0047 | DC-525 | |
| B | 4700 | | | | 81I-0047 | DC-525 | |
| C50 | .01 | 400 | 33E3424 | D6-103 | GP3-333-103 | PT411 | |
| C51 | 560 | | C144675-32 | DD-561 | 81I-561 | UC-5356 | |
| C52 | .047 | 400 | 33E3414 | DF-503 | | PT4147 | |
| C53 | 5000 | | 33E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C54 | 5000 | | 33E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C55 | 30 | | B137727-81 | | | | |

## CAPACITORS (cont)

| ITEM No. | RATING: CAP. | VOLT. | REPLACEMENT DATA: SENTINEL PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C56 | .047 | 400 | 33E3414 | DF-503 | | PT4147 | |
| C57 | .022 | 200 | 33E3412 | DF-203 | 81Y-02 | PT4122 | |
| C58 | .25 | 25 | A157810-1-1 | | | PT4025 | |
| C59 | 33 | | D137727-126 | | | | |
| C60 | 220 | 500 | C137498-22-1 | D6-221 | 81I-221 | | |
| C61 | .01 | 400 | 33E3424 | D6-103 | GP3-333-103 | PT411 | |
| C62 | 1300 | | C144675-33-1 | | | | |
| C63 | 560 | | C144675-32-1 | DD-561 | 81I-561 | UC-5356 | |
| C64 | .047 | 400 | 33E3414 | DF-503 | | PT4147 | |
| C65 | 82 | 3000 | C158215-32-1 | DD30-820 | | | |
| C66 | .068 | 200 | 33E3415 | | | | |
| C67 | 68 | 3000 | C158215-3 | DD-30-680 | 5KV-680 | DC30468 | |
| C68 | 1000 | | 22E4004-5 | DD-103 | 80I-001 | DC-531 | |
| C69 | 5000 | | 22E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C70 | 5000 | | 22E4004-15 | DD-502 | 81I-005 | DC-525 | |
| C71 | 5000 | 1000 | | | | | |

† Items C47A, C47B, C47C, R51A, R51B, R51C are combined in one unit.
▪ Items C49A, C49B, R58A, R58B are combined in one unit.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | WATTS | REPLACEMENT DATA: SENTINEL PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 1Meg | ½ | B157805-1-4 | Q11-136▪ | A47-750K-S▪ | AB-66▪ | | Vertical Hold, Fixed |
| | | | | | | | | Minimum 350KΩ |
| B | Shaft | | Not Req. | Not Req. | FS-3 | AK-3 | | Attach to R1A. |
| R1 | 1Meg | ½ | 28E131 | | | | | Vertical Hold, See Note #1 |
| R2A | 145KΩ | ½ | B157803-1-4 | Q11-125† | A47-75K-S† | B-35† | | Horizontal Hold Stop at 70KΩ |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | | Attach to R2A. |
| R3 | 145KΩ | ½ | 28E128 | | | | | Horizontal Hold See Note #1 |
| R3A | 330KΩ | ½ | B157803-1-3 | Q13-132 | A47-500K-Z | AB-80 | TA334A | Volume |
| B | Shaft | | Not Req. | Not Req. | FS-6 | AK-3 | Not Req. | Attach to R3A. |
| C | Switch | | Not Req. | 76-1 | SWK-12 | KB-1 | US-38 | Attach to R3A. |
| R3 | 330KΩ | ½ | 28E129 | | | | | Volume See Note #1 |
| R4A | 1500Ω | ½ | B157804-1-3 | Q17-109 | A47-1500-S | AB-515 | U-5 | Contrast |
| B | Shaft | | Not Req. | Not Req. | FS-3 | AK-3 | Not Req. | Attach to R5A. |
| R4 | 1500Ω | ½ | 28E130 | | | | | Contrast See Note #1 |
| R5A | 5Meg | ½ | B157801-1-3 | Q17-141 | A47-5Meg-S | | TA56R | Brightness |
| B | Shaft | | Not Req. | Not Req. | FKS-1/4 | | Not Req. | Attach to R5A. |
| R6A | 750Ω | ½ | B157800-1-3 | Q11-105 | A47-750-S | AB-5 | TAP75L | Vertical Linearity |
| B | Shaft | | Not Req. | TQ | RN-3 | AK-19 | Not Req. | Attach to R6A. |
| R7A | 5Meg | ½ | B157908-1-3 | Q11-141▪ | A47-4Meg-S▪ | AB-38▪ | TAP355L▪ | Height, Stop at 4Meg |
| B | Shaft | | Not Req. | TQ | RN-3 | AK-19 | Not Req. | Attach to R7A. |
| R8 | 1Meg | ½ | B159037-1-1 | | | | | Noise Gate, Left Hand Terminal Open |
| R9 | 500Ω | 2 | A157955-2-1 | | 39-500 | | | Buzz (Wire Wound) |

▪ Connect a 330KΩ resistor in series with the left hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down.)
† Connect a 85KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down.)
• Connect a 1Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down.)
Note 1. Used in model 1U-1034B only.

## RESISTORS

| ITEM No. | RATING: OHMS | WATT | REPLACEMENT DATA: SENTINEL PART No. | IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R10 | 470KΩ | ½ | 27E474M-½ | BTS-470K | |
| R11 | 470KΩ | ½ | 27E474M-½ | BTS-470K | |
| R12 | 680KΩ | ½ | 27E684K-½ | | |
| R13 | 10KΩ | ½ | 27E103K-½ | BTS-10K | |
| R14 | 2200Ω | ½ | 27E222K-½ | BTS-2200 | |
| R15 | 8200Ω | ½ | 27E822K-½ | | |
| R16 | 10KΩ | ½ | 27E103K-½ | BTS-10K | |
| R17 | 15KΩ | ½ | 27E153K-½ | | |
| R18 | 220KΩ | ½ | 27E224K-½ | | |
| R19 | 10KΩ | ½ | 27E103K-½ | BTS-10K | |
| R20 | 1000Ω | ½ | 27E102K-½ | BTS-1000 | |
| R21 | 470Ω | ½ | 27E472K-½ | | |
| R22 | 2700Ω 5% | ½ | 27E272K-½ | | |
| R23 | 1000Ω | ½ | 27E102K-½ | BTS-1000 | |
| R24 | 10KΩ | ½ | 27E103K-½ | | |
| R25 | 220Ω | ½ | 27E221K-½ | | |
| R26 | 47Ω | ½ | 27E470K-½ | BTS-47 | |
| R27 | 1000Ω | ½ | 27E102K-½ | BTS-1000 | |
| R28 | 1000Ω | ½ | 27E102K-½ | BTS-1000 | |
| R29 | 68Ω | ½ | 27E680K-½ | BTS-68 | |
| R30 | 12KΩ | ½ | 27E123K-½ | | |
| R31 | 100KΩ | ½ | 27E102K-½ | BTS-1000 | |
| R32 | 150Ω | ½ | 27E151K-½ | BTS-150 | |
| R33 | 5600Ω | ½ | 27E562K-½ | | |
| R34 | 1Meg | ½ | 27E105M-½ | BTS-1Meg | |
| R35 | 1Meg | ½ | 27E105M-½ | | |
| R36 | 8200Ω | 1 | 27E822K-1 | BTA-8200 | |
| R37 | 33KΩ | 1 | 27E333K-1 | | |
| R38 | 5600Ω | 2 | A15691I-2-2 | | |
| R39 | 10KΩ | ½ | 27E103K-½ | BTS-10K | |
| R40 | 47Ω | ½ | | BTS-47 | |
| R41 | 390KΩ | ½ | 27E394K-½ | | |
| R42 | 820KΩ | ½ | 27E824K-½ | | |
| R43 | 470KΩ | ½ | | BTS-470K | Note 1 |
| R44 | 100KΩ | ½ | 27E104K-½ | BTS-100K | |
| R45 | 10KΩ | ½ | 27E103K-½ | BTS-10K | |
| R46 | 150Ω | ½ | 27E151K-½ | BTS-150 | |

| ITEM No. | RATING: OHMS | WATT | REPLACEMENT DATA: SENTINEL PART No. | IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R47 | 5600Ω | 1 | 27E562K-1 | BTA-5600 | |
| R48 | 470Ω | ½ | 27E471K-½ | BTS-470 | |
| R49 | 560KΩ | ½ | 27E564K-½ | BTS-560K | |
| R50 | 470KΩ | ½ | 27E474K-½ | BTS-470K | |
| R51A | 10KΩ | ½ | | | |
| B | 220KΩ | ½ | †A157813-1-3 | | |
| C | 2.2Meg | ½ | | | |
| R52 | 22KΩ | ½ | 27E223K-½ | BTS-22K | |
| R53 | 1Meg | ½ | 27E105K-½ | | |
| R55 | 47KΩ | ½ | 27E473K-½ | BTS-47K | |
| R56 | 680KΩ | ½ | 27E684K-½ | | |
| R56 | 680KΩ | ½ | 27E682K-½ | | |
| R57 | 4700Ω | ½ | 27E472K-½ | | |
| R58A | 22KΩ | ½ | ▪A157812-1-2 | | |
| B | 10KΩ | ½ | | | |
| R59 | 5600Ω | 2 | A15691I-2-2 | | |
| R60 | 680Ω | ½ | 27E681K-½ | BTS-680 | |
| R61 | 680Ω | ½ | 27E681K-½ | BTS-680 | |
| R62 | 560KΩ | ½ | 27E564K-½ | BTS-560K | |
| R63 | 150KΩ | ½ | 27E154K-½ | | |
| R64 | 150KΩ | ½ | 27E154K-½ | | |
| R65 | 100KΩ | ½ | 27E104K-½ | BTS-100K | |
| R66 | 1000Ω | ½ | 27E102K-½ | BTS-1000 | |
| R67 | 100KΩ | ½ | 27E104K-½ | BTS-100K | |
| R68 | 27KΩ | ½ | 27E273K-½ | BTS-27K | |
| R69 | 8200Ω | 1 | 27E822K-½ | BTA-8200 | |
| R70 | 150KΩ | ½ | 27E154K-½ | | |
| R71 | 2.7Meg | ½ | 27E275K-½ | | |
| R72 | 18KΩ | ½ | 27E183K-½ | BTS-18K | |
| R73 | 470KΩ | ½ | 27E474K-½ | BTS-470K | |
| R74 | 100Ω | ½ | 27E101K-½ | | |
| R75 | 12KΩ | 3 | A15691I-5-1 | | |
| R76 | 22Ω | 1 | | | Note 1 |
| R77 | 470Ω | ½ | 27E472K-½ | | |
| R78 | 45Ω | 30 | A158230-3-1 | 2D-50 | |
| R79 | 7.5Ω | 5 | B154089-1-6 | | |
| R80 | 33KΩ | 1 | | BTA-33K | |

† Items C47A, C47B, C47C, R51A, R51B, R51C are combined in one unit.
▪ Items C49A, C49C, C49B, R58A, R58B are combined in one unit.
Note 1. Not used in some versions.

## TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No | USE | REPLACEMENT DATA: SENTINEL PART No | Halldorson PART No | Merit PART No. | RCA TYPE No. | Ram PART No | Stancor PART No. | Thordarson PART No. | Triad PART No |
|---|---|---|---|---|---|---|---|---|---|
| T1 | Vert. Osc. Trans. | B155255-3-1 | B6702 | A-3006 | | V405 | A-8125 | 26A03 | A-97X |
| T2 | Horiz. Output Trans. | 20E995 | FB418* | HVO-37* | | X123* | A-8263* | FLY-25* | D-48* |
| R3 | Vert. Output Trans. | 20E97 | | A-2824 | | | | | |
| T4A | Yoke Horiz. (20MH) | ADI584Z6-1-2 | DF807① ② | MDF-92 ① ② | 235D1 ① ② | | DY-16A ① ② | Y-16 ① ② | Y-41 ① ② |
| B | Vert. (40MH) | | | | | | | | |

① Use original rear cover and centering device.
② Use original horizontal damping network.

### *HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

| ORIGINAL TERMINAL (CONNECTIONS) | Halldorson Replacement Connections | Merit Replacement Connections | RCA Replacement Connections | Ram Replacement Connections | Stancor Replacement Connections | Thordarson Replacement Connections | Triad Replacement Connections |
|---|---|---|---|---|---|---|---|
| 7 | 7 | 7 | | H. V. | 7 | H. V. | H. V. |
| 6 | 6 | 6 | | 3 | 6 | 6 | 6 |
| 3 | 3 | 3 | | 7 | 3 | 3 | 3 |
| 5 | 5 | 5 | | 2 | 5 | 5 | 5 |
| 2 | 2 | 2 | | 6 | 2 | 2 | 2 |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No | IMPEDANCE: PRI | SEC | REPLACEMENT DATA: SENTINEL PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| T5 | 2.4KΩ | 3.4Ω | B157819-1-3 | Z1005 ① | A-2905 ① | A-3825 ① | | S-4X ① | ① Drill one new mounting hole. |

## SPEAKER

| ITEM No. | RATINGS: SIZE | FIELD | V. C. IMP. | REPLACEMENT DATA: SENTINEL PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 4" | PM | 3.4Ω | C157898-1-3 ① | 4A07 | ① Used in Models 1U-1001B, 1U-1011B |
| | 8" | PM | 3.4Ω | 1E34-3 ② | 8A21 | ② Used in Models 1U-1017B, 1U-1034B. |

## COILS (RF-IF)

| ITEM No. | USE | DC RES.: PRI. | SEC. | REPLACEMENT DATA: SENTINEL PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | Ant. Matching Trans. | 0Ω | 0Ω | 3ITA-413 | | | | |
| L2 | Ant. Matching Trans. | 0Ω | 0Ω | 3ITA-413 | | | | |
| L3A | Ant., RF, Mixer Grid, Osc. Coils | .0Ω | | 31M-302A | | | | Channel 2 |
| B | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-303A | | | | Channel 3 |
| C | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-304A | | | | Channel 4 |
| D | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-305A | | | | Channel 5 |
| E | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-306A | | | | Channel 6 |
| F | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-307A | | | | Channel 7 |
| G | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-308A | | | | Channel 8 |
| H | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-309A | | | | Channel 9 |
| I | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-310A | | | | Channel 10 |
| J | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-311A | | | | Channel 11 |
| K | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 13M-312A | | | | Channel 12 |
| L | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 13M-313A | | | | Channel 13 |
| L4 | RF Coil | .7Ω | | 35A-127-01 | | | | |
| L5 | Conv. Plate | .7Ω | | 31UA-501 | | | | |
| L6 | 1st Video IF | .3Ω | | AA157787-1-5 | 17-1003 | TV-102 | 617LA | |
| L7 | 2nd Video IF | .6Ω | .3Ω | 20E994 | 17-1004 | TV-102 | 6350 | |
| L8 | FIL Choke | 0Ω | | AB155256-1-1 | 19-1000 | | 6603 | |
| L9 | 3rd Video IF | .5Ω | .3Ω | B158234-1-3 | 17-1005 | | 6353 | Includes 21.9 MC |
| L10 | 4th Video IF | .3Ω | .6Ω | B158235-1-4 | 17-1001* | TV-100* | 6351 | |
| L11 | Series Peaking Coil | 3.4Ω | | B158362-1-1 | 19-1006 | | 4624 | 16 Microhenries |
| L12 | Shunt Peaking Coil | | | | | | | Note 3 |
| L13A | 4.5MC Trap | 3Ω | | B158363-1-2 | | | | |
| B | 1st Sound IF | 1.1Ω | | | | | | |
| L14 | Shunt Peaking Coil | 19Ω | | B158222-1-1 | 19-3660m | | 4651m | 685 Microhenries; Wound on 4.7KΩ resistor |

# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (cont)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | PRI. | SEC. | SENTINEL PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | |
| L15 | Series Peaking Coil | 11Ω | | B158223-1-1 | 19-4201▲ | TV-184▲ | 6154▲ | 210 Microhenries; Wound on 33KΩ resistor. Note 1 |
| L16 | 2nd Sound IF | 2Ω | 3.2Ω | B158354-1-2 | | | | |
| L17 | Quadrature Coil | 5.3Ω | | B158351-1-2 | 20-1005 | TV-151 | 1480 | |
| L18 | Horiz. Osc. | 29Ω | 65Ω | C158225-1-2 | 20-1402 | TV-162 | 6183 | Waveform Winding=48Ω |

Note 1. Alternate Part #B158630-1-1.
Note 2. Not used in some versions.
* Detune trap winding.
■ Parallel with 4.7KΩ resistor.
▲ Parallel with 27KΩ resistor.

## FILTER CHOKE

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | TOTAL DIRECT CURRENT | D.C. RESISTANCE | INDUCTANCE (0 CURRENT 1000 ∿) | SENTINEL PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| L19 | .200ADC | 52.5Ω | 1.28HY | B155529-1-2 | C5040 | C-2994 | C-2327 | 26C41 | C-21X ① |

① Drill one new mounting hole.

## SELENIUM RECTIFIER

| ITEM No. | RATING | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | CURRENT | SENTINEL PART No. | FEDERAL PART No. | INTERNATIONAL PART No. | MALLORY PART No. | RADIO RECEPTOR PART No. | SARKES TARZIAN PART No. | |
| M1 | .200 ADC | C155575-2-1 | 1090A | MR-300 | 6S-300 | 6Q4 | 300 | |
| M2 | .200 ADC | C155575-2-1 | 1090A | MR-300 | 6S-300 | 6Q4 | 300 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | SENTINEL PART No. | NOTES |
|---|---|---|---|
| M3 | Tuner | B158847-1-3 | VHF-Models 1U-1001B, 1U-1011B, 1U-1017B |
| | Tuner | 20E1061 | VHF-Model 1U-1034B |
| M4 | Centering Device | | Part of deflection yoke rear cover (T4) |
| M5 | Ion Trap | B153109-2-3 | |
| B3 | Trimmer Cap. | A157870-1-1 | Horiz. Lock (10-160MMF) |
| | Knob | 37E95 | Channel Selector-Model 1U-1001B |
| | Knob | 37E95-2 | Channel Selector-Models 1U-1011B, 1U-1017B, 1U-1034B |
| | Knob | 37E94 | Fine Tuning |
| | Knob | 37E93 | Horiz. Hold, Vert. Hold, Contrast, & On-Off-Volume |
| | Safety Glass | 9E50-4 | Models 1U-1011B, 1U-1017B |
| | Safety Glass | 9E50-6 | Model 1U-1001B |
| | Safety Glass | 9E50-8 | Model 1U-1034B |
| | Mask | 36E101-4 | Model 1U-1001B |
| | Mask | 36E102-3 | Models 1U-1011B, 1U-1017B |
| | Mask | 36E96 | Model 1U-1034B |

# TROUBLE SHOOTING AIDS (cont)

## HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V11, V12, V13 and V14. Check waveform W12.

| If Satisfactory | If Unsatisfactory |
|---|---|
| Check T2, T4A, C64, C65, C66, R75 and other associated components. | Check L18, C56, C60, C61, C62, C63, R67, R68, R72 and other associated components. |

INSUFFICIENT HIGH VOLTAGE

Check by substitution V12 and V13. Check M1 and M2. Check R75, R79, C62, C63 and other associated components.

BLOOMING

Check by substitutin V12, V13 and V14. Check M1 and M2. Check R75, R78, R79, C62, C63, C66 and other associated components.

## GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or no Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6 and V9. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

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3924 MEADE ST.
DENVER, COLORADO

# SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet just above the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 wood screws holding wood strip at the bottom of the safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS - NOISE GATE CONTROL ADJUSTMENTS

Tune in a strong TV signal.

Turn the noise gate control (R8) (located on top of chassis) fully counter clockwise, then clockwise until picture begins to tear at top. Turn R8 counter clockwise just past the point of unstable sync.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the set. Adjustment is located on top of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, it is necessary to remove rear cover and supply power to the set. Adjust the buzz control (R9) for maximum volume and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

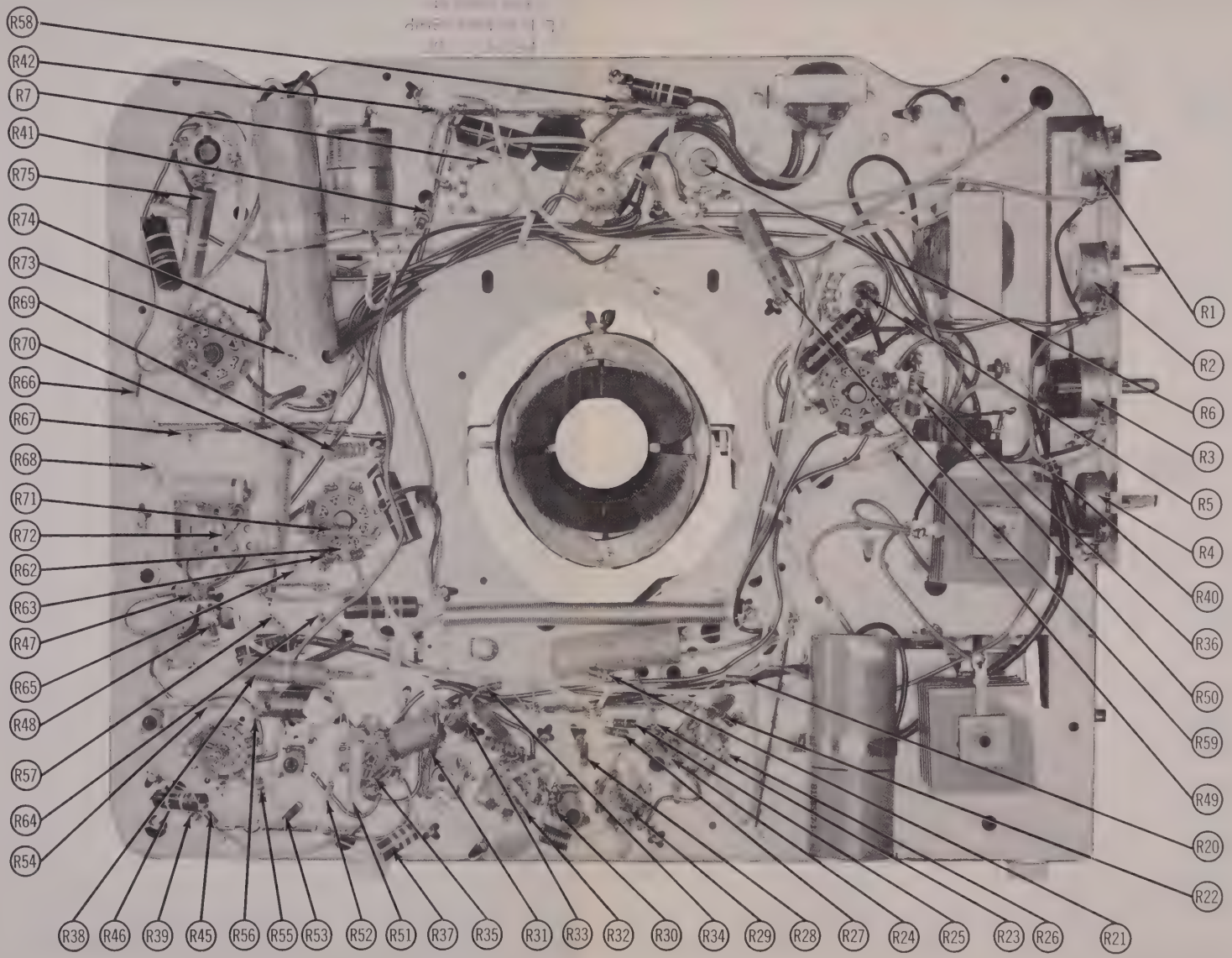
# DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL (TABLE MODELS)

1. Remove 6 push-on type control knobs from side panel of cabinet.
2. Remove 5 wood screws. Remove rear cover.
3. Remove 1 wood screw. Remove antenna terminal bracket.
4. Disconnect speaker leads.
5. Place cabinet face down on a soft surface.
6. Remove only the 6 cabinet mounting screws located under and on the outer edges of the cabinet base.
7. Remove 2 wood screws from the lower rear corner supports braces.
8. Return cabinet to its normal upright position.
9. Lift cabinet straight up and off.
10. Remove 2 speaker nuts. Remove speaker.

CHASSIS REMOVAL (CONSOLE MODELS)

1. Perform steps 1, 2, 3 and 4 as above.
2. Remove chassis mounting board screws under guide rails, and one screw under center support bridge.
3. Slide chassis (with mounting board) out of cabinet.




CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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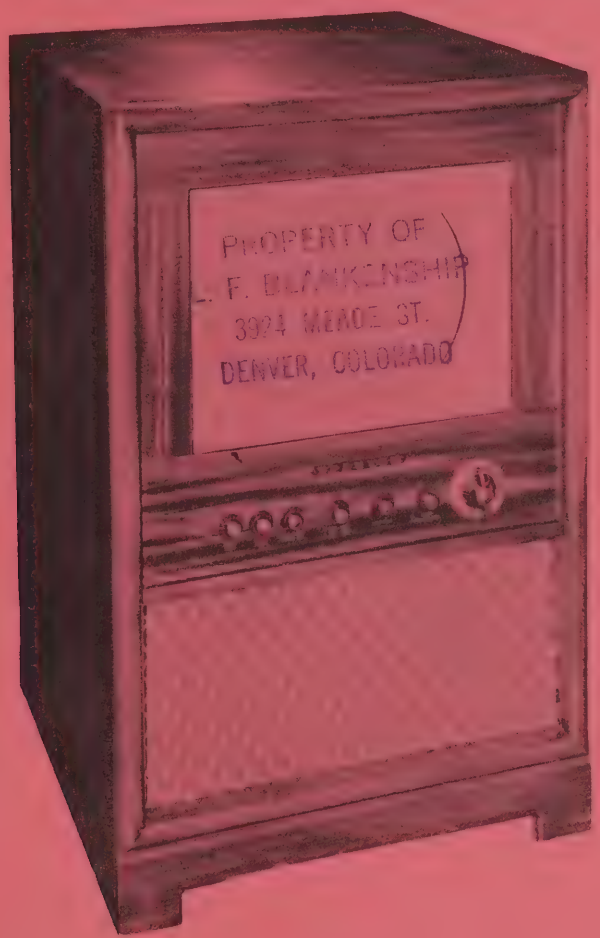


MODEL 16A211

SPARTON MODEL
16A211 (Ch. CTV-2)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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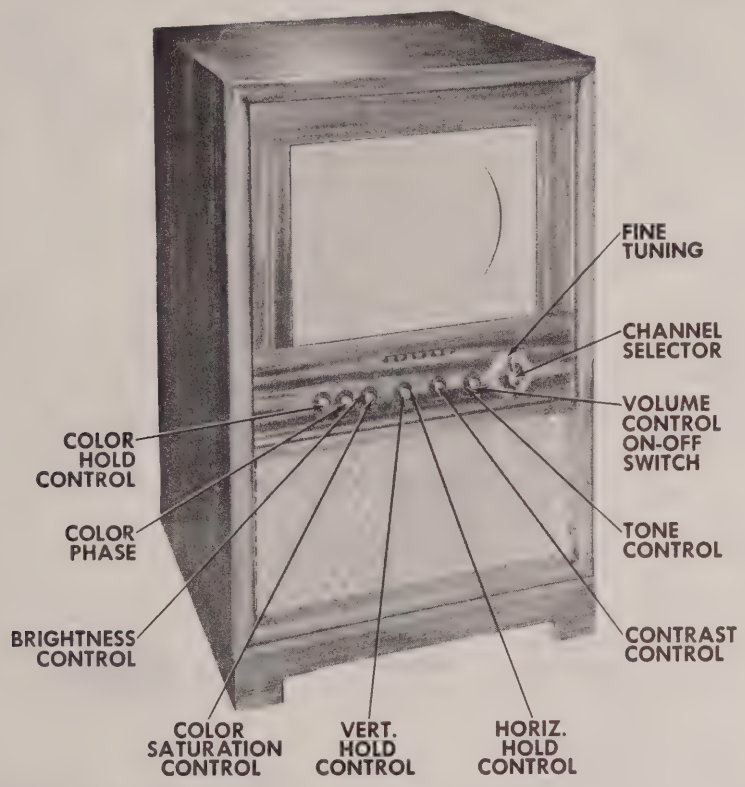


| | |
|---|---|
| TRADE NAME | Sparton Model 16A211 (Ch. CTV-2) |
| MANUFACTURER | Sparton, Division of Sparks-Withington Co., Jackson, Michigan |
| TYPE SET | Color Television Receiver |
| TUBES | Forty-Four |
| POWER SUPPLY | 110-120 Volts AC-60 Cycle |
| RATING | 3.8 Amp. @ 117 Volts AC |
| TUNING RANGE | Channels 2 thru 13, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier) |

## INDEX

Alignment Instructions ..... 6, 7
Block Diagram ..... 3
Disassembly Instructions ..... 35
Miscellaneous Adjustments ..... 22, 23
Parts List and Descriptions ..... 28 thru 33
Photographs
Cabinet-Rear View ..... 19
Capacitor Identification (RF-IF Chassis (C7-C107) ..... 14, 15
Capacitor Identification (RF-IF Chassis (C154-C206) .....12, 17
Capacitor Identification (Sweep Chassis) .. 20, 25
Chassis-Top View (RF-IF Chassis) ..... 9
Chassis-Top View (Sweep Chassis) ..... 9
High Voltage Compartment ..... 7
Picture Tube Assembly ..... 26
Photographs (Cont)
RF Tuner ..... 10
Resistor Identification (RF-IF Chassis) (R1-R142) ..... 11, 18
Resistor Identification (RF-IF Chassis) (R179-R248) ... 13, 16
Resistor Identification (Sweep Chassis) ..... 21, 24
Trans., Inductor & Alignment Identification (RF-IF Chassis) .....27
Trans., Inductor & Alignment Identification (Sweep Chassis) ..... 26
Resistance Measurements ..... 4
Service Adjustment Location Chart ..... 35
Schematic (Tuner) ..... 34
Schematic (TV) ..... 2
Tube Placement Chart (Bottom View) ..... 5
Tube Placement Chart (Top View) ..... 8

SPARTON MODEL
16A211 (Ch. CTV-2)

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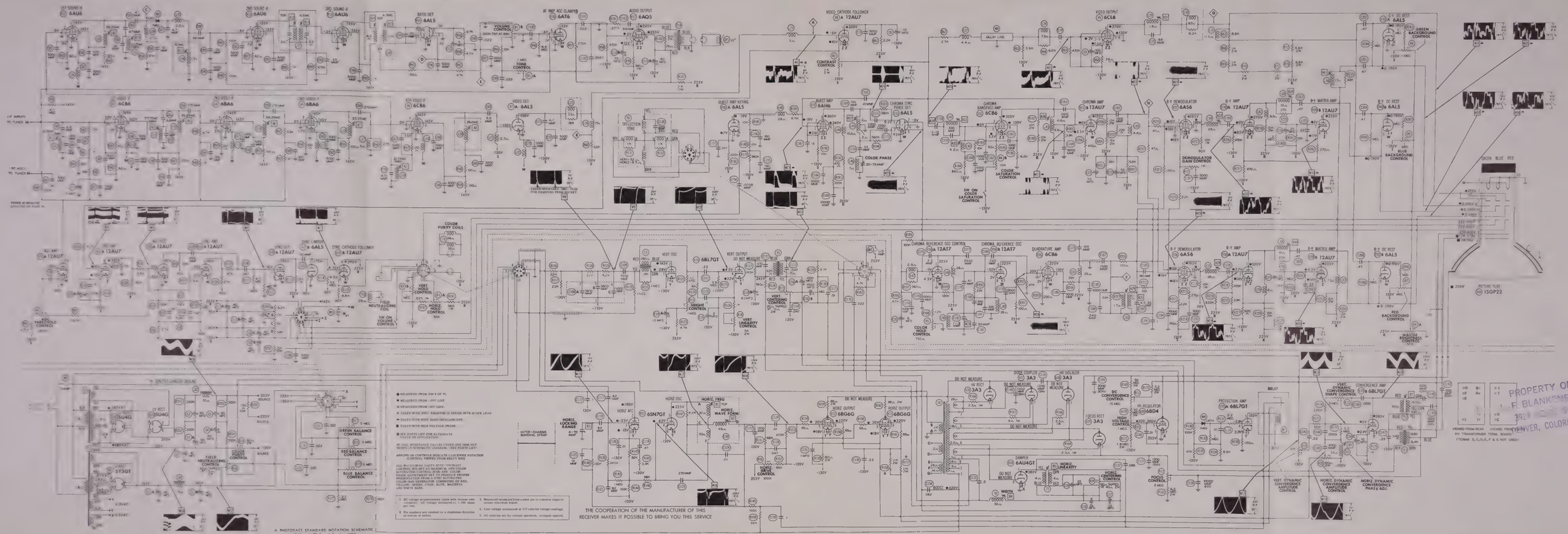


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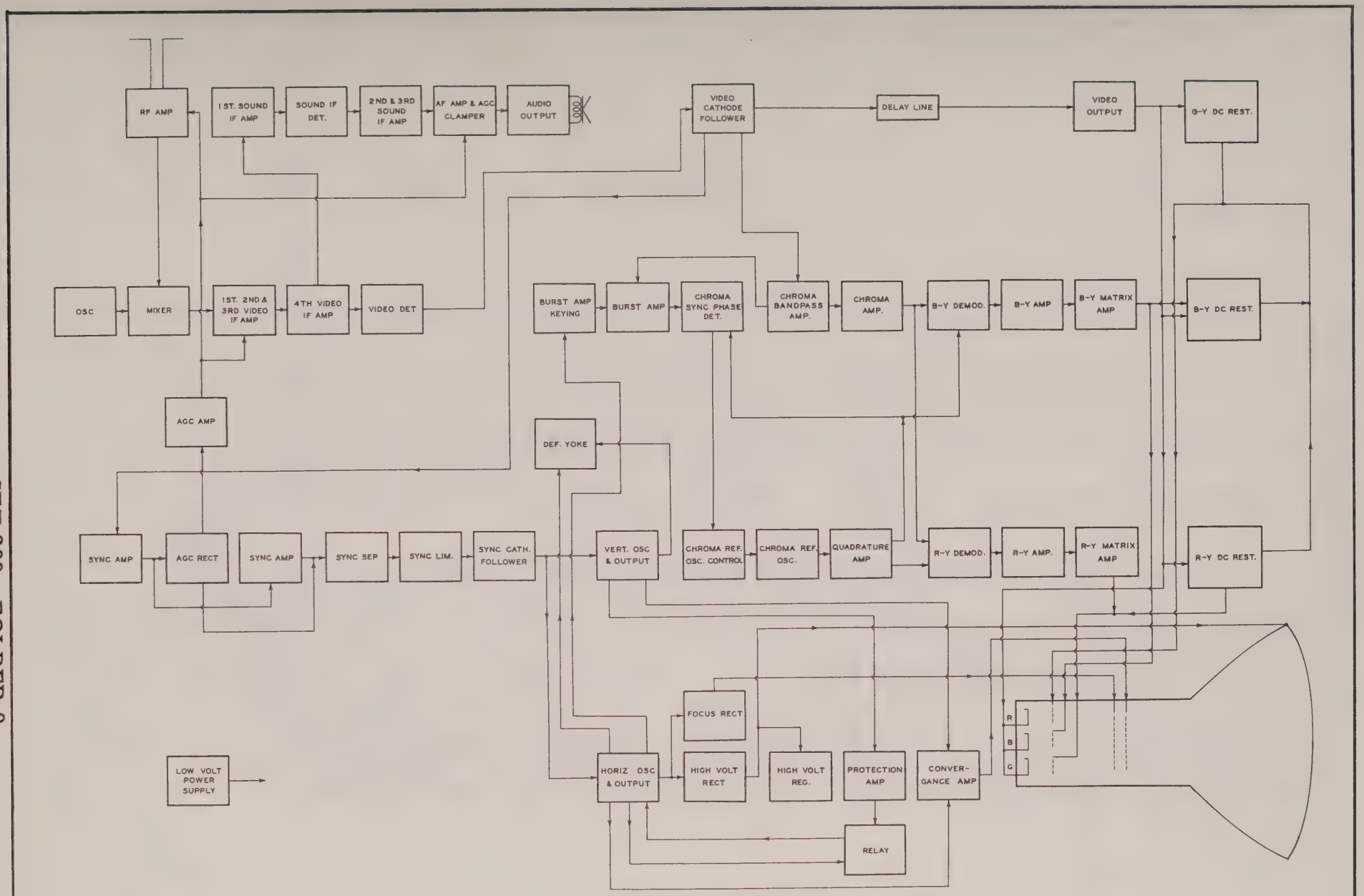



BLOCK DIAGRAM

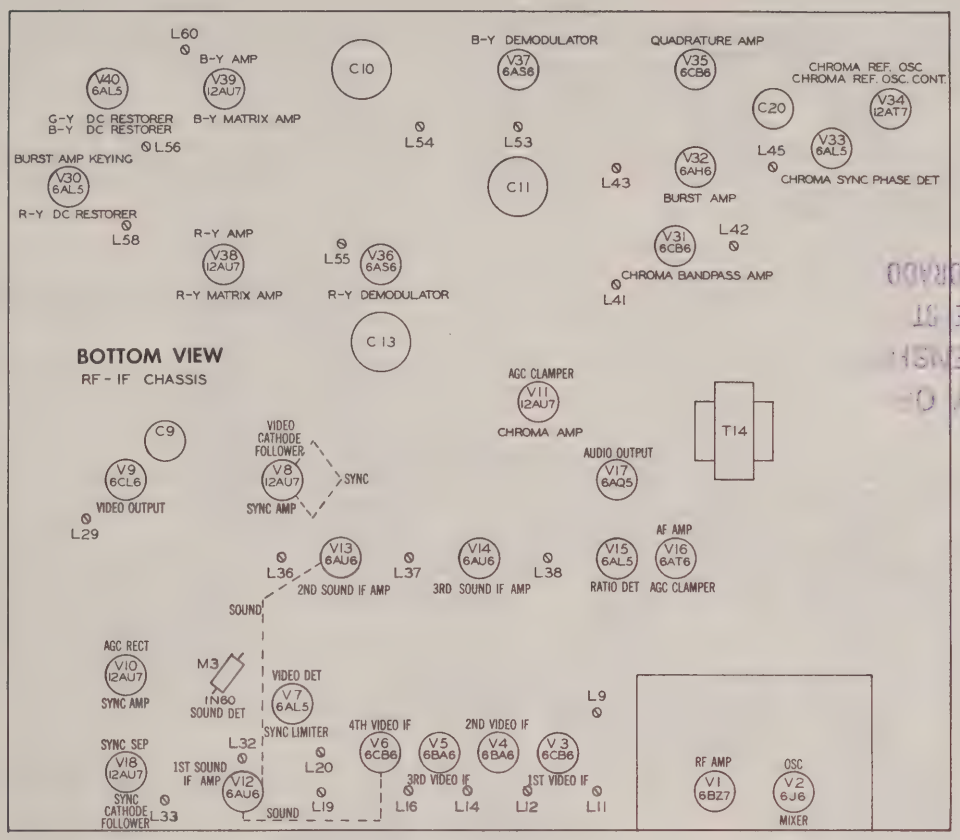
SPARTON MODEL 16A211 (Ch. CTV-2)

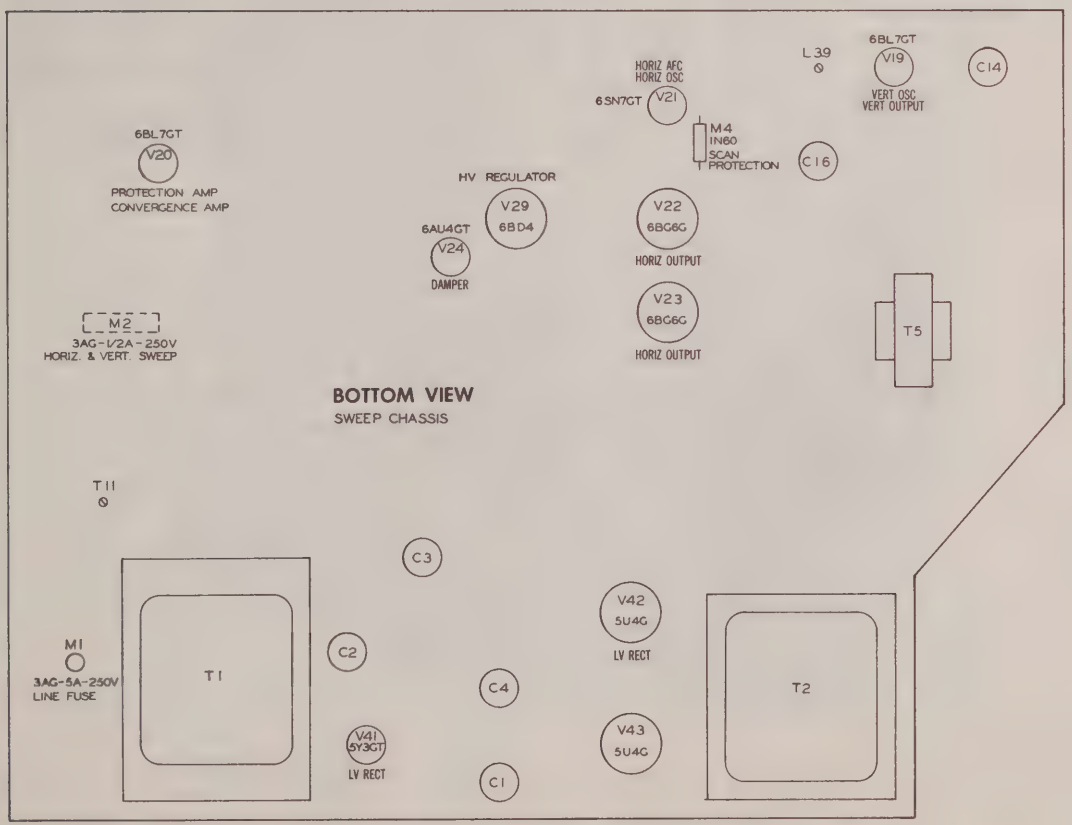
# RESISTANCE MEASUREMENTS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BZ7 | INF | 300KΩ | 0Ω | .1Ω | 0Ω | †2.8KΩ | 180KΩ | INF | 0Ω |
| V2 | 6J6 | ‡15KΩ | ‡250Ω | .1Ω | 0Ω | 230KΩ | 10KΩ | 0Ω | | |
| V3 | 6CB6 | 45KΩ | 130Ω | 0Ω | .1Ω | ‡250Ω | ‡250Ω | 82Ω | | |
| V4 | 6BA6 | 90KΩ | 0Ω | 0Ω | .1Ω | ‡250Ω | ‡250Ω | 100Ω | | |
| V5 | 6BA6 | 90KΩ | 0Ω | 0Ω | .1Ω | ‡250Ω | ‡250Ω | 100Ω | | |
| V6 | 6CB6 | 3Ω | 130Ω | 0Ω | .1Ω | ‡350Ω | ‡250Ω | 0Ω | | |
| V7 | 6AL5 | 2.5KΩ | 6.5KΩ | 0Ω | .1Ω | 2.5KΩ | 0Ω | 4Meg | | |
| V8 | 12AU7 | †2.3KΩ | 6.5KΩ | 3.3KΩ | 2.5KΩ | 2.5KΩ | †20KΩ | 8KΩ | 5.8KΩ | 2.5KΩ |
| V9 | 6CL6 | 2.5KΩ | 470KΩ | †8.5KΩ | 2.5KΩ | 2.5KΩ | †3.5KΩ | 2.5KΩ | †8.5KΩ | 470KΩ |
| V10 | 12AU7 | †30KΩ | 20KΩ | 90KΩ | .1Ω | .1Ω | †35KΩ | 180KΩ | 300KΩ | 0Ω |
| V11 | 12AU7 | 90KΩ | 300KΩ | 2.5KΩ | .1Ω | .1Ω | †30KΩ | 2.5KΩ | 3KΩ | 0Ω |
| V12 | 6AU6 | 0Ω | 0Ω | 0Ω | .1Ω | ‡250Ω | ‡250Ω | 82Ω | | |
| V13 | 6AU6 | 700KΩ | 0Ω | .1Ω | 0Ω | ‡1.1KΩ | ‡1.1KΩ | 82Ω | | |
| V14 | 6AU6 | 470KΩ | 0Ω | 0Ω | .1Ω | ‡1.1KΩ | ‡1.1KΩ | 0Ω | | |
| V15 | 6AL5 | INF | INF | 0Ω | .1Ω | 4.7KΩ | 0Ω | 4.7KΩ | | |
| V16 | 6AT6 | 6.8Meg | 0Ω | 0Ω | .1Ω | 240KΩ | 240KΩ | †275KΩ | | |
| V17 | 6AQ5 | 470KΩ | 3KΩ | 2.5KΩ | 2.5KΩ | †3.5KΩ | †3.2KΩ | 470KΩ | | |
| V18 | 12AU7 | †15KΩ | 1Meg | 0Ω | .1Ω | .1Ω | †200Ω | 4Meg | 9KΩ | 0Ω |
| V19 | 6BL7GT | 1.4Meg | †1.5Meg | 2.5KΩ | 4Meg | †1.4KΩ | 4.4KΩ | 2.5KΩ | 2.5KΩ | |
| V20 | 6BL7GT | 3.3Meg | †1.4KΩ | 3.5KΩ | 2.5Meg | †5.5KΩ | 150Ω | 2.5KΩ | 2.5KΩ | |
| V21 | 6SN7GT | 1.8Meg | †50KΩ | 250KΩ | 210KΩ | †110KΩ | 2.5KΩ | 2.5KΩ | 2.5KΩ | |
| V22 | 6BG6G | TP | 2.5KΩ | 2.7KΩ | TP | 470KΩ | TP | 2.5KΩ | †§5.5KΩ | |
| V23 | 6BG6G | TP | 2.5KΩ | 2.7KΩ | NC | 470KΩ | TP | 2.5KΩ | †§5.5KΩ | |
| V24 | 6AU4GT | TP | NC | 300KΩ | TP | †150Ω | TP | .1Ω | 0Ω | |
| V25 | 3A3 | 15Meg | 15Meg | 15Meg | INF | 15Meg | 15Meg | 15Meg | INF | TOP CAP ▲2.5Ω |
| V26 | 3A3 | | PINS | 1 - 8 | HAVE | INF | RESISTANCE | | | TOP CAP ▲30Ω |
| V27 | 3A3 | | PINS | 1 - 8 | HAVE | INF | RESISTANCE | | | TOP CAP ‡INF |
| V28 | 3A3 | 100Meg | 100Meg | 100Meg | INF | 100Meg | 100Meg | 100Meg | INF | TOP CAP INF |
| V29 | 6BD4 | †200Ω | 0Ω | TP | TP | 2Meg | NC | .1Ω | TP | TOP CAP 100Meg |
| V30 | 6AL5 | 220KΩ | †1.1Meg | 0Ω | .1Ω | †2Meg | 0Ω | 600KΩ | | |
| V31 | 6CB6 | 3.2KΩ | 7KΩ | 2.5KΩ | 2.5KΩ | †20KΩ | †16KΩ | 7KΩ | | |
| V32 | 6AH6 | 600KΩ | 12.5KΩ | 2.5KΩ | 2.5KΩ | †600Ω | †100KΩ | 12.5KΩ | | |
| V33 | 6AL5 | 560KΩ | 560KΩ | 0Ω | .1Ω | INF | 0Ω | INF | | |
| V34 | 12AT7 | †200Ω | INF | 1.6KΩ | .1Ω | .1Ω | †300Ω | 22KΩ | 26Ω | 0Ω |
| V35 | 6CB6 | 47KΩ | 220Ω | 0Ω | .1Ω | †200Ω | †39KΩ | 0Ω | | |
| V36 | 6AS6 | 8KΩ | 4.8KΩ | 2.5KΩ | 2.5KΩ | †16KΩ | †8.5KΩ | 8KΩ | | |
| V37 | 6AS6 | 8KΩ | 4.8KΩ | 2.5KΩ | 2.5KΩ | †16KΩ | †8.5KΩ | 8KΩ | | |
| V38 | 12AU7 | †5.2KΩ | 470KΩ | 3.3KΩ | 2.5KΩ | 2.5KΩ | †8KΩ | 20KΩ | 3.3KΩ | 2.5KΩ |
| V39 | 12AU7 | †10KΩ | 470KΩ | 3KΩ | 2.5KΩ | 2.5KΩ | †8KΩ | 12KΩ | 3.3KΩ | 2.5KΩ |
| V40 | 6AL5 | †2Meg | †1.1Meg | 0Ω | .1Ω | †2Meg | 0Ω | †1.1Meg | | |
| V41 | 5Y3GT | NC | 150KΩ | NC | 29Ω | NC | 30Ω | NC | 150KΩ | |
| V42 | 5U4G | TP | 8.5KΩ | NC | 2.5KΩ | NC | 2.5KΩ | NC | 8.5KΩ | |
| V43 | 5U4G | NC | 8.5KΩ | NC | 2.5KΩ | NC | 2.5KΩ | NC | 8.5KΩ | |
| V44 | 15GP22 | .1Ω | †3.5KΩ | †2Meg | ▲600KΩ | NC | 15Meg | †3.5KΩ | †2Meg | ▲1.8Meg |
| | | PIN 10 NC | PIN 11 NC | PIN 12 NC | PIN 13 100Meg | PIN 14 NC | PIN 15 NC | PIN 16 NC | PIN 17 ▲600KΩ | PIN 18 †2Meg |
| | | PIN 19 †3.5KΩ | PIN 20 0Ω | | | | | | | |

† MEASURED FROM PIN 2 OF V43.
‡ MEASURED FROM PIN 8 OF V41.
▲ MEASURED FROM PIN 3 OF V24.
TP - TIE POINT.
NC - NO CONNECTION.
§ MEASURED WITH RELAY CONTACTS (M7) CLOSED.

# TUBE PLACEMENT CHART




SPARTON MODEL
16A211 (Ch. CTV-2)

# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

Remove the horizontal oscillator tube (V21) from its socket. This will eliminate the high voltage shock hazard.

## VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5 volt bias supply to the ungrounded side of C7. Connect the positive lead to chassis.
In step 1 adjust A2 starting with slug turned maximum clockwise (out of coil).

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | Direct | High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis. | 21.75MC (Unmod) | Any | DC probe to point (A). Common to point (B). | A1, A2 | Increase signal generator to provide usable reading on VTVM. Adjust for MINIMUM deflection. |
| 2. | " | " | 27.75MC | " | " | A3 | " |
| 3. | " | " | 22.2MC | " | " | A4 | Attenuate generator output for approximately 1.5 volts at VTVM. Adjust for maximum deflection. |
| 4. | " | " | 25.25MC | " | " | A5 | " |
| 5. | " | " | 24.25MC | " | " | A6 | " |
| 6. | " | " | 23.25MC | " | " | A7 | " |
| 7. | " | " | 26.0MC | " | " | A8 | " |

## OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output for usable pattern on scope.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 8. | Direct | High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis. | 24MC (10MC Swp) | 21.75MC<br>22.5MC<br>22.4MC<br>24.0MC<br>25.5MC<br>26.25MC<br>27.75MC | Any | Vert. amp. thru 47KΩ to point (A). Low side to point (B). | | Check for response curve similar to Fig. 1. If necessary retouch A3 thru A8 for desired response. Increase sweep generator and marker generator output to observe 21.75MC and 27.75MC trap markers. If necessary, SLIGHTLY retouch A1 and A2 to place 21.75 MC marker in trap notch. Retouch A3 to place 27.75MC marker in trap notch. |

## SOUND IF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 9. | Direct | High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis. | 26.25MC (Unmod) | Any | DC probe to ungrounded side of C86. Common to chassis. | A9 | Attenuate signal generator output to produce not more than 1.5 volts at VTVM. Adjust for maximum deflection. |
| 10. | " | " | 21.75MC | " | " | A10 | Adjust for MINIMUM deflection. |
| 11. | .01MFD | High side to point (C). Low side to chassis. | 4.5MC (Unmod) | " | DC probe to point (D). Common to chassis. | A11, A12, A13, A14 | Adjust signal generator to produce not more than 8 volts at VTVM at maximum adjustment. Adjust A11, A12, A13 and A14 for maximum deflection. |
| 12. | " | " | " | " | DC probe to point (E). Common to chassis. | A15 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |
| 13. | " | " | " | " | DC probe to point (D). Common to chassis. | | Readjust A12, A13 and A14 SLIGHTLY for maximum deflection on VTVM. Repeat step 12. |

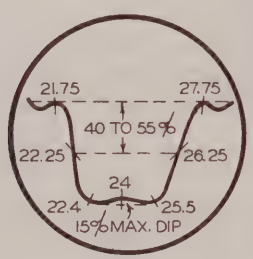


FIG. 1

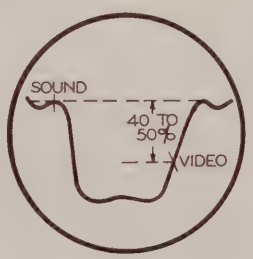


FIG. 2

# ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect bias as under "Video IF Alignment".
The channel adjustment screws are reached thru a hole just to the right of the channel switch shaft.
The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 14. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 57MC (10MC Swp) | 55.25MC 59.75MC | 2 | Vert. Amp. thru 10KΩ to point (A). Low side to point (B). | A16 | Adjust to place sound marker in trap notch as in Fig. 2. Video marker should fall at 40 to 55% on high frequency slope of response curve. Replace V21 in its socket. |
| | | | 63MC (10MC Swp) | 61.25MC 65.75MC | 3 | | A17 | |
| | | | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | | A18 | |
| | | | 79MC (10MC Swp) | 77.25MC 81.75MC | 5 | | A19 | |
| | | | 85MC (10MC Swp) | 83.25MC 87.75MC | 6 | | A20 | |
| | | | 177MC (10MC Swp) | 175.25MC 179.75MC | 7 | | A21 | |
| | | | 183MC (10MC Swp) | 181.25MC 185.75MC | 8 | | A22 | |
| | | | 189MC (10MC Swp) | 187.25MC 191.75MC | 9 | | A23 | |
| | | | 195MC (10MC Swp) | 193.25MC 197.75MC | 10 | | A24 | |
| | | | 201MC (10MC Swp) | 199.25MC 203.75MC | 11 | | A25 | |
| | | | 207MC (10MC Swp) | 205.25MC 209.75MC | 12 | | A26 | |
| | | | 213MC (10MC Swp) | 211.25MC 215.75MC | 13 | | A27 | |

RF AND MIXER ALIGNMENT

The RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

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L F PLUMMER
3324 MARK ST.
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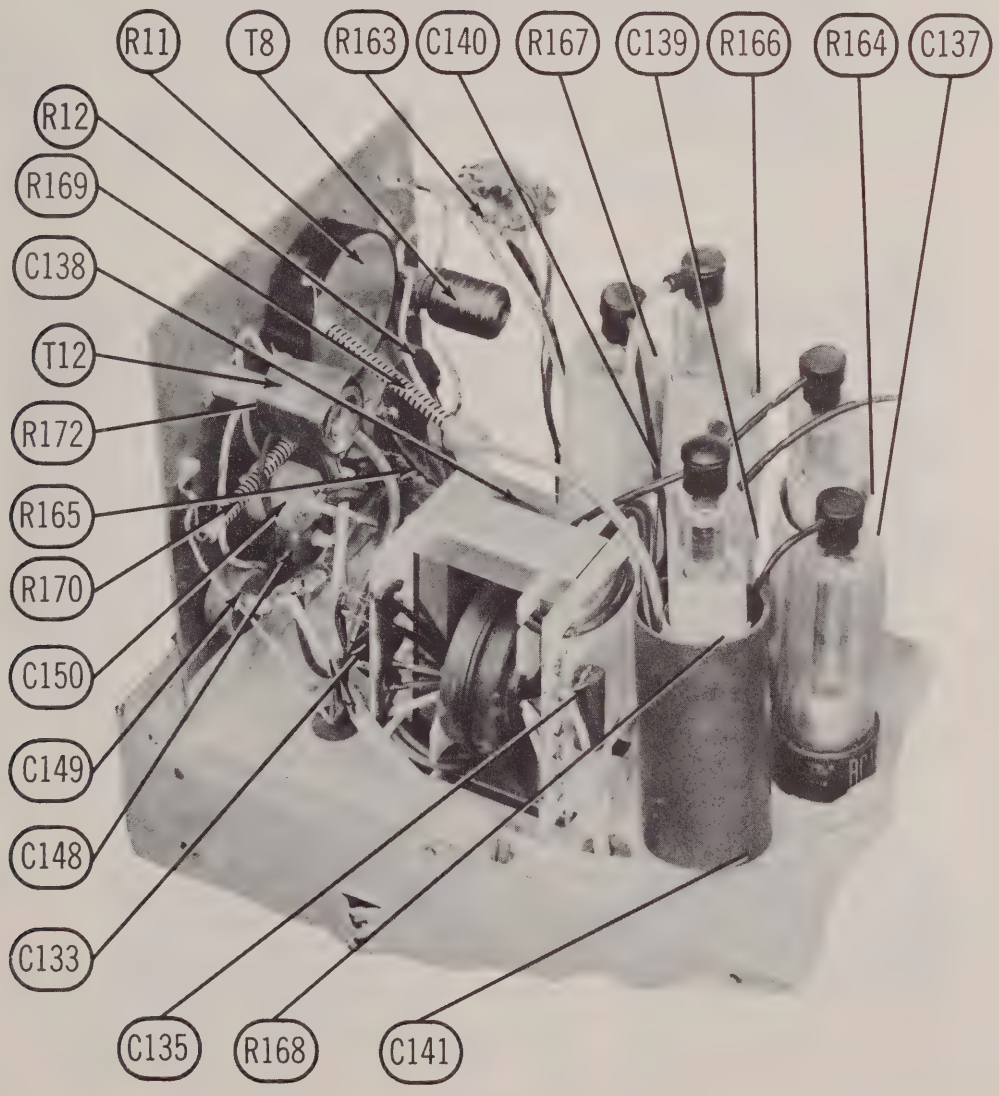
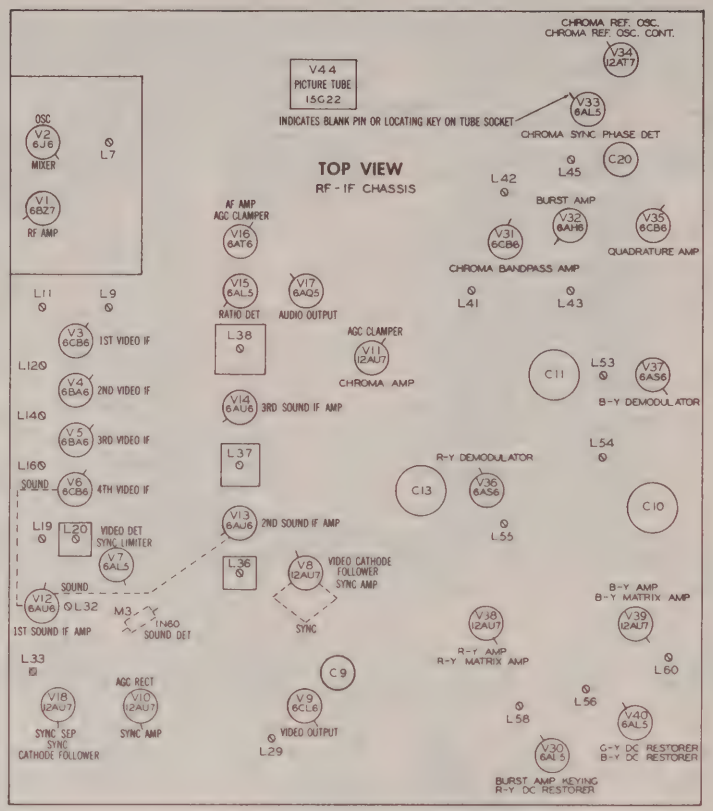
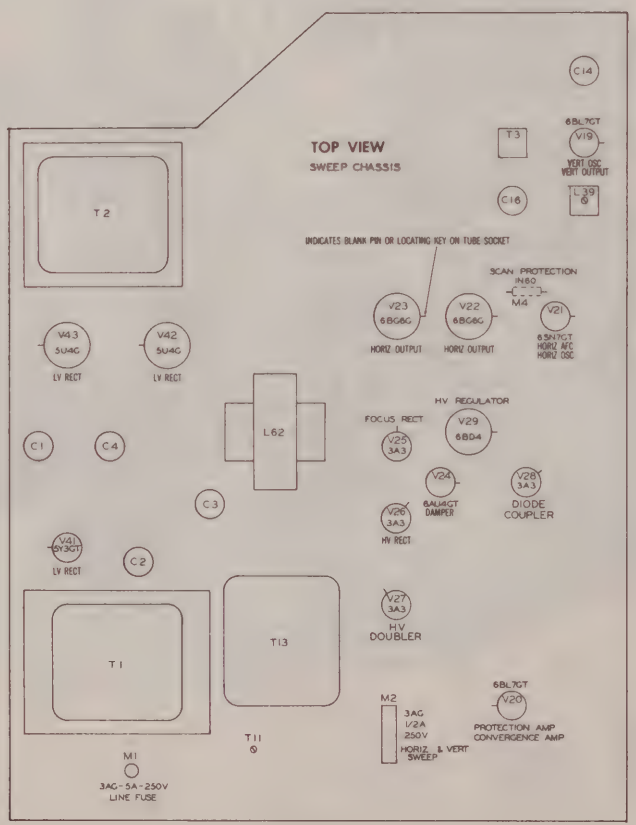
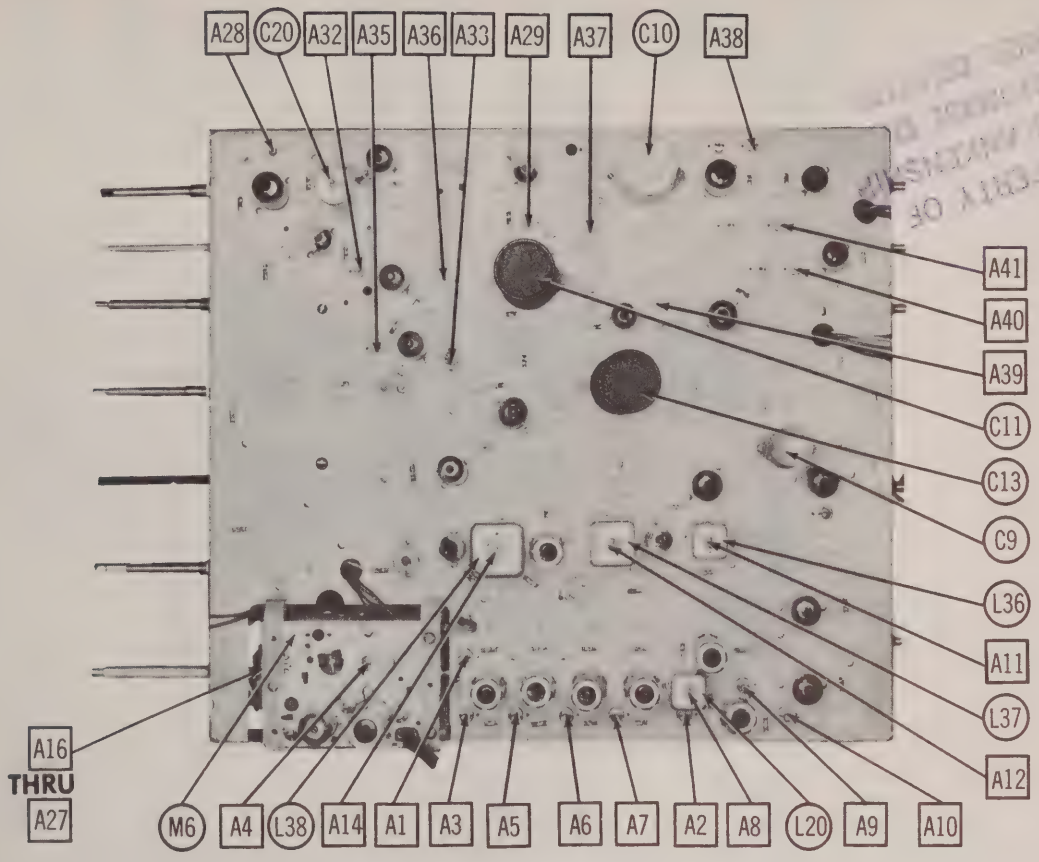



HIGH VOLTAGE COMPARTMENT

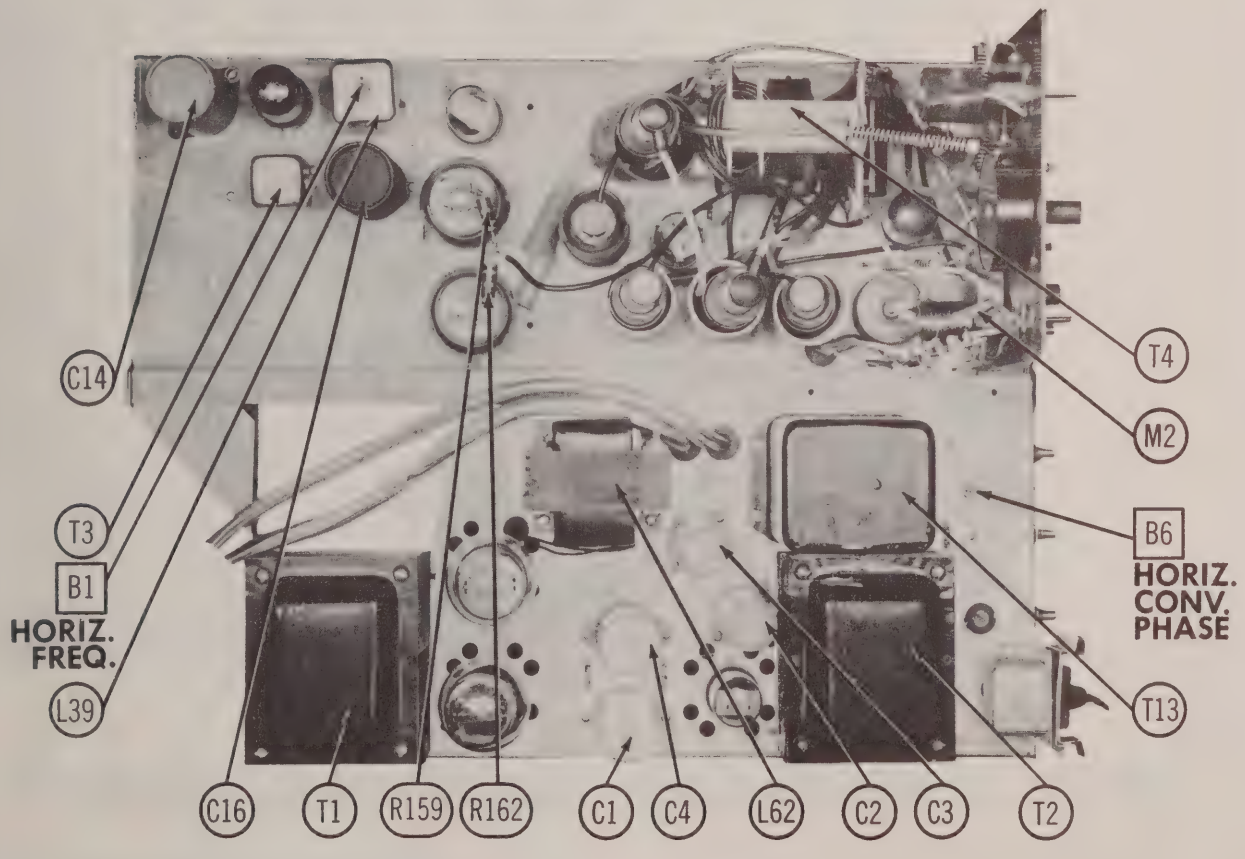
# TUBE PLACEMENT CHART



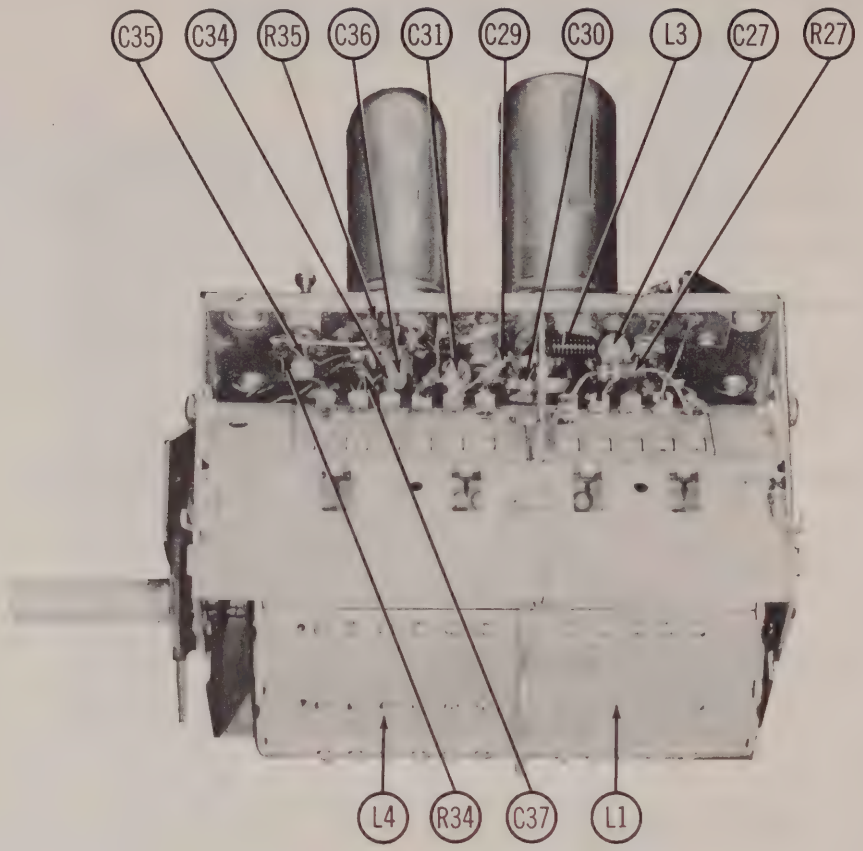





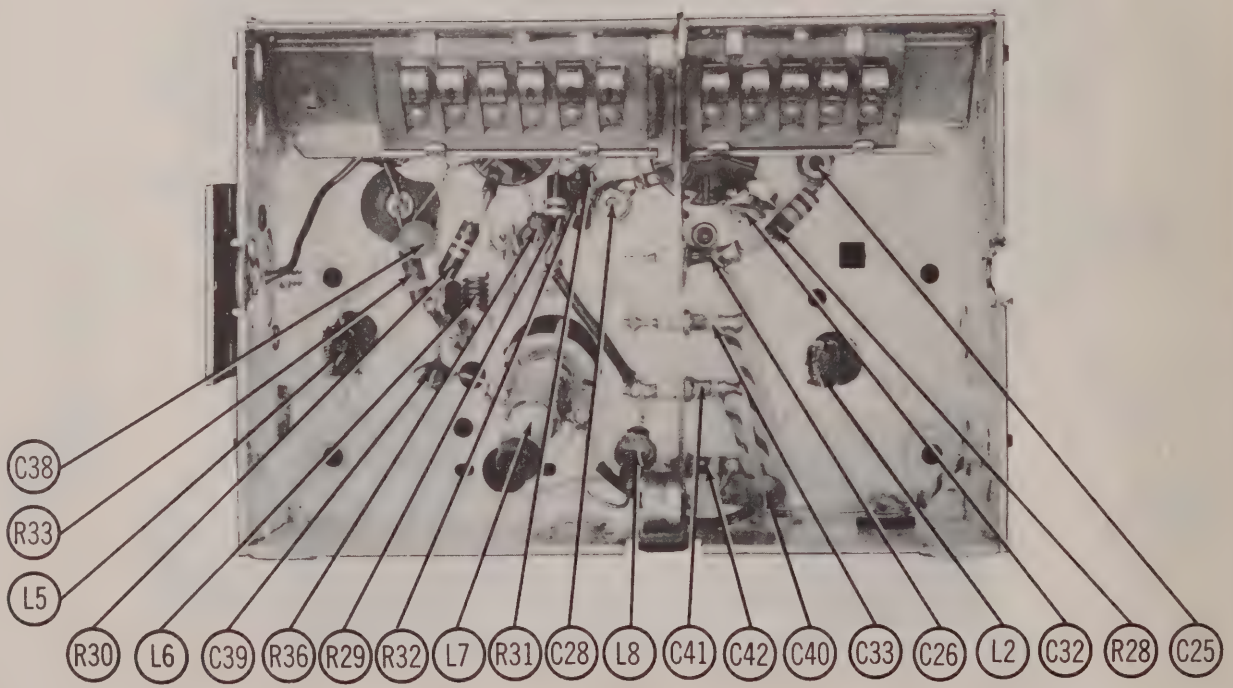

RF-IF CHASSIS-TOP VIEW



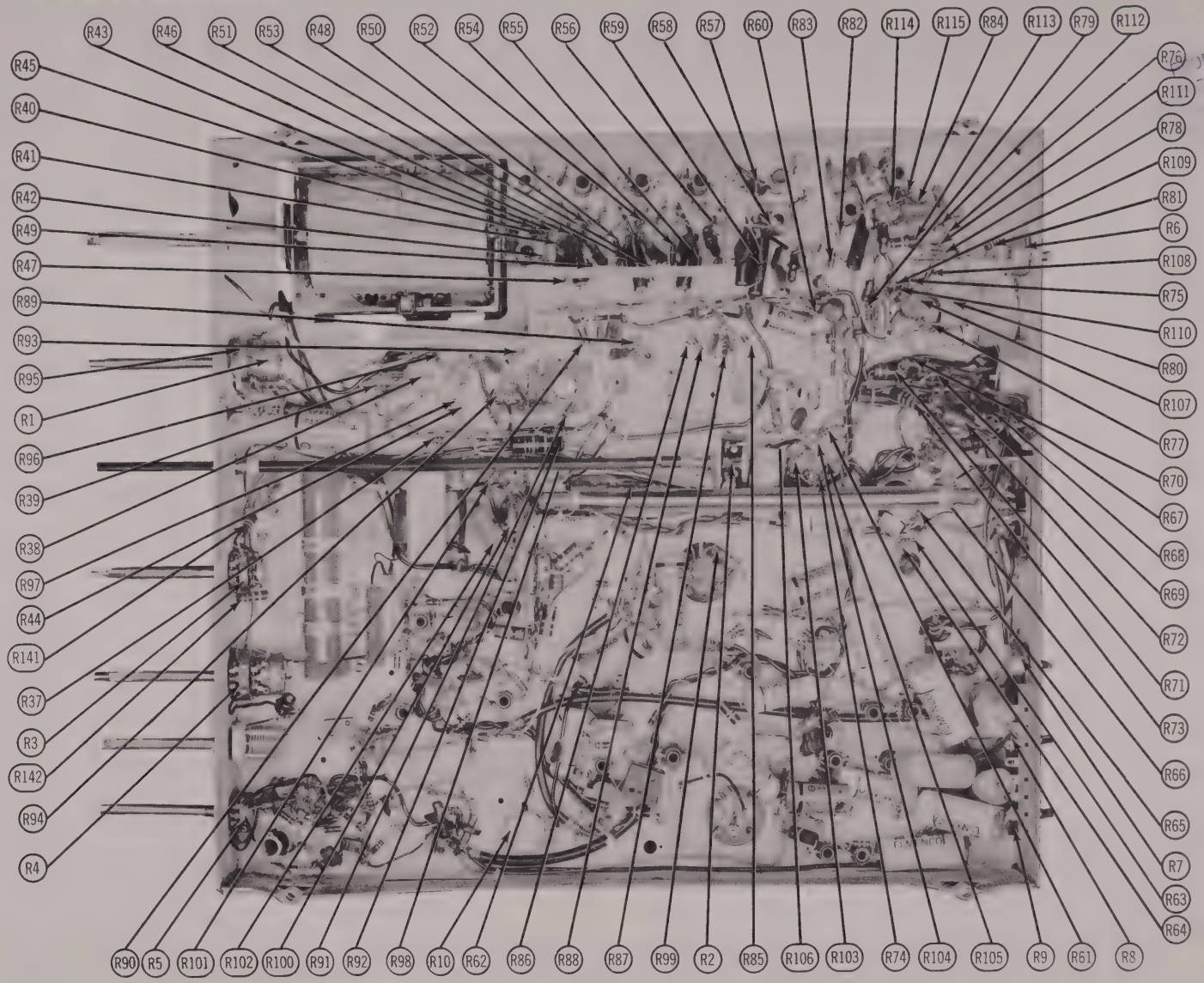

SWEEP CHASSIS-TOP VIEW



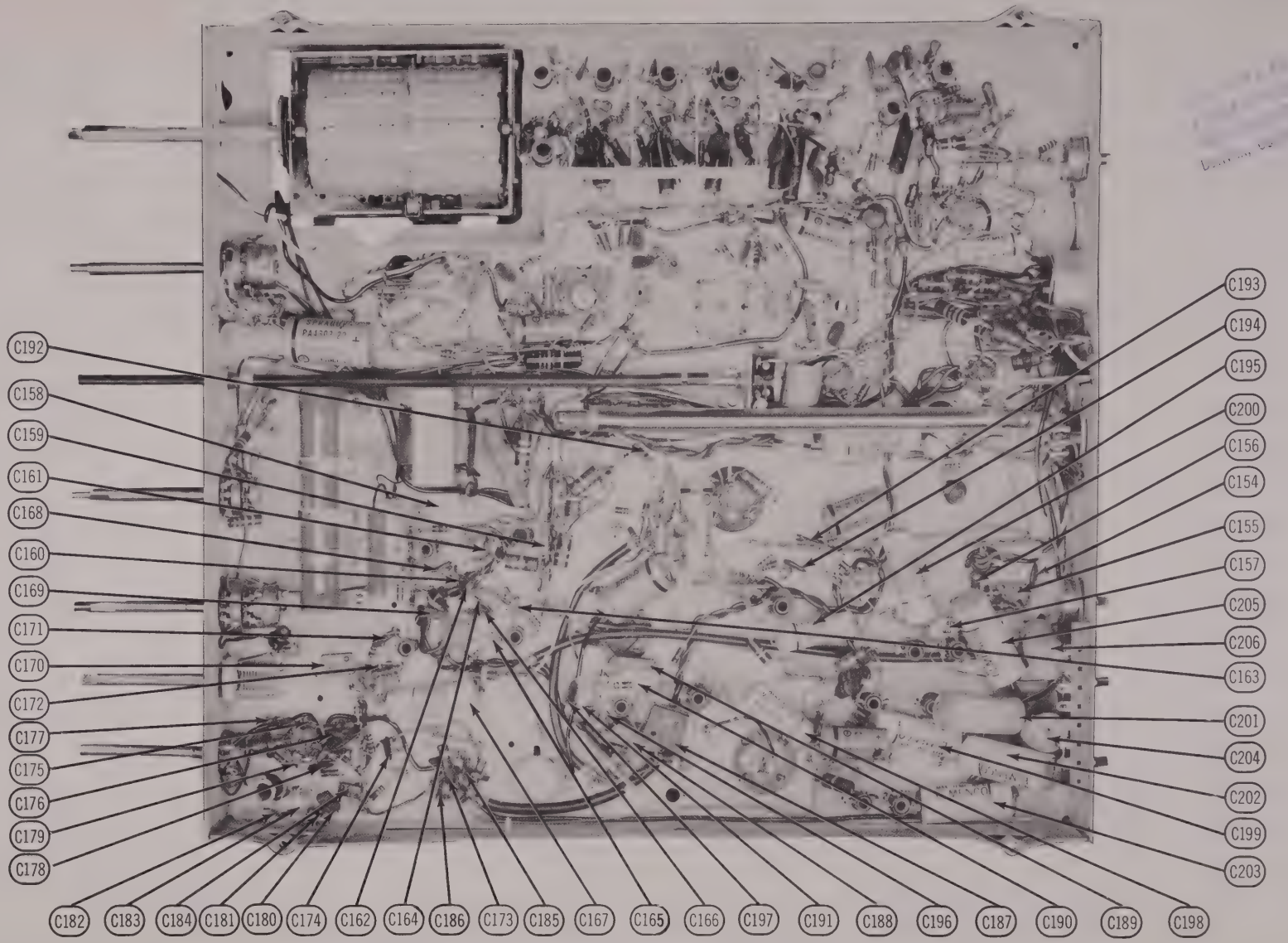

**RF TUNER-RIGHT SIDE**




**RF TUNER-BOTTOM VIEW**




RF-IF CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION (R1 - R142)

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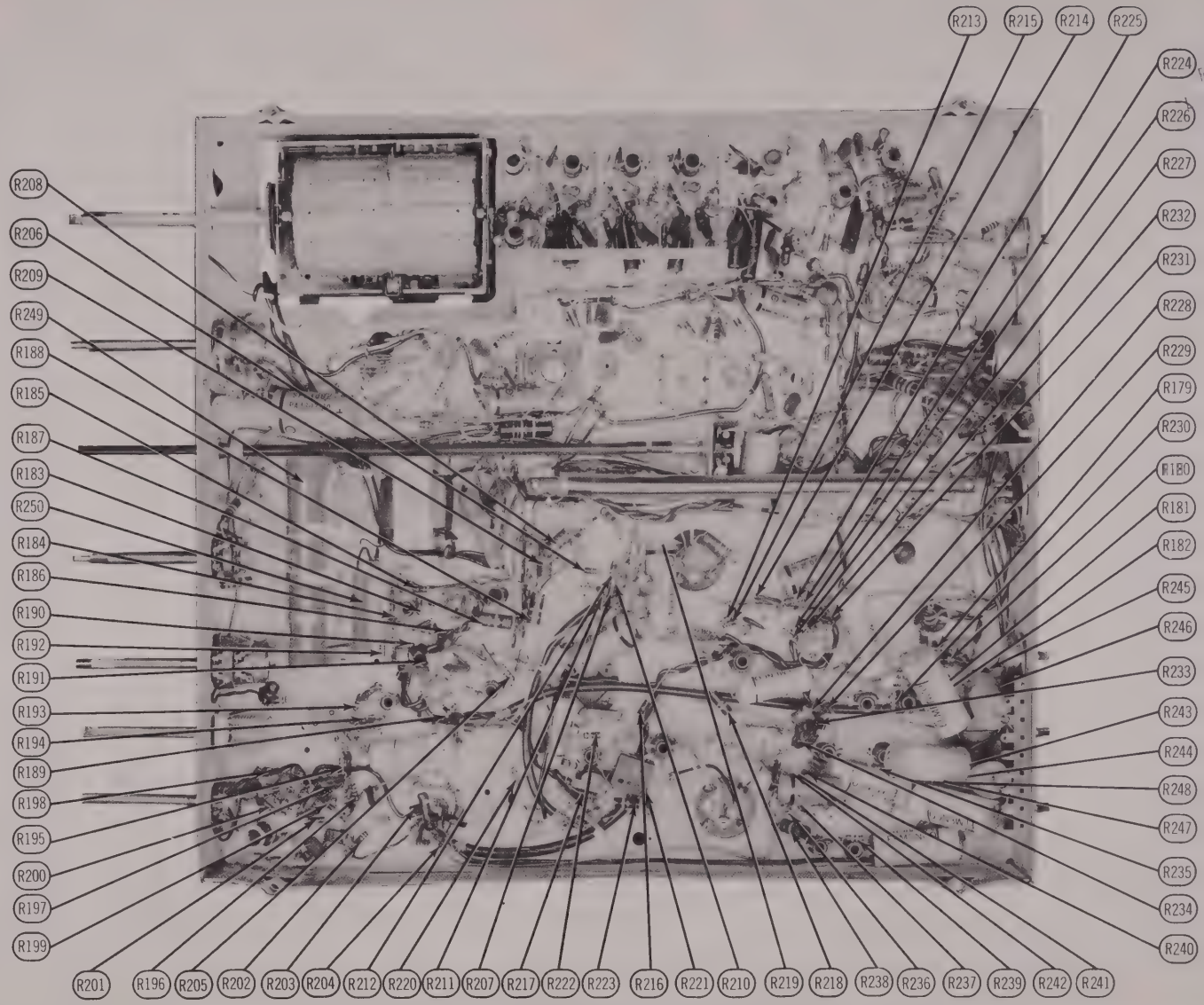


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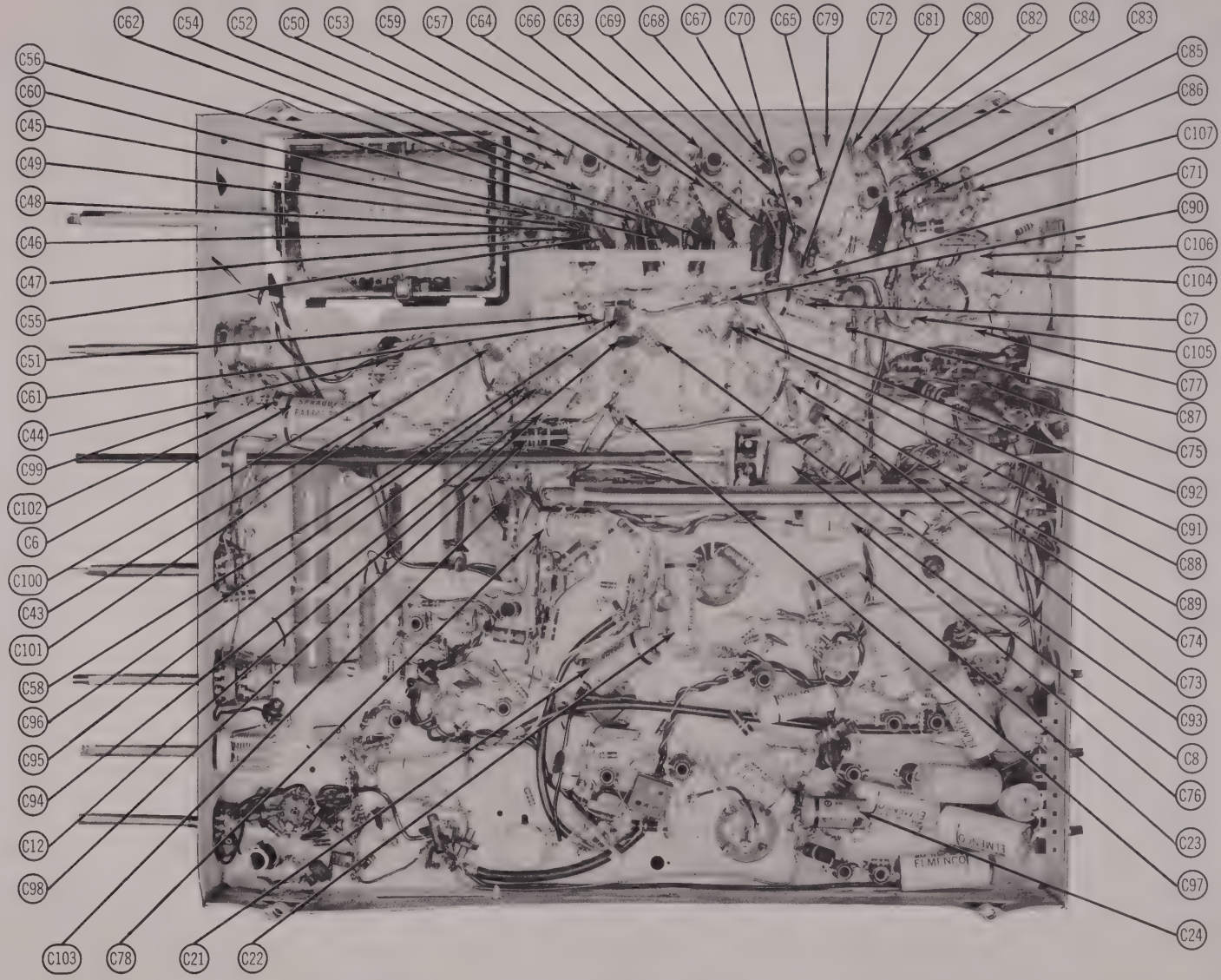
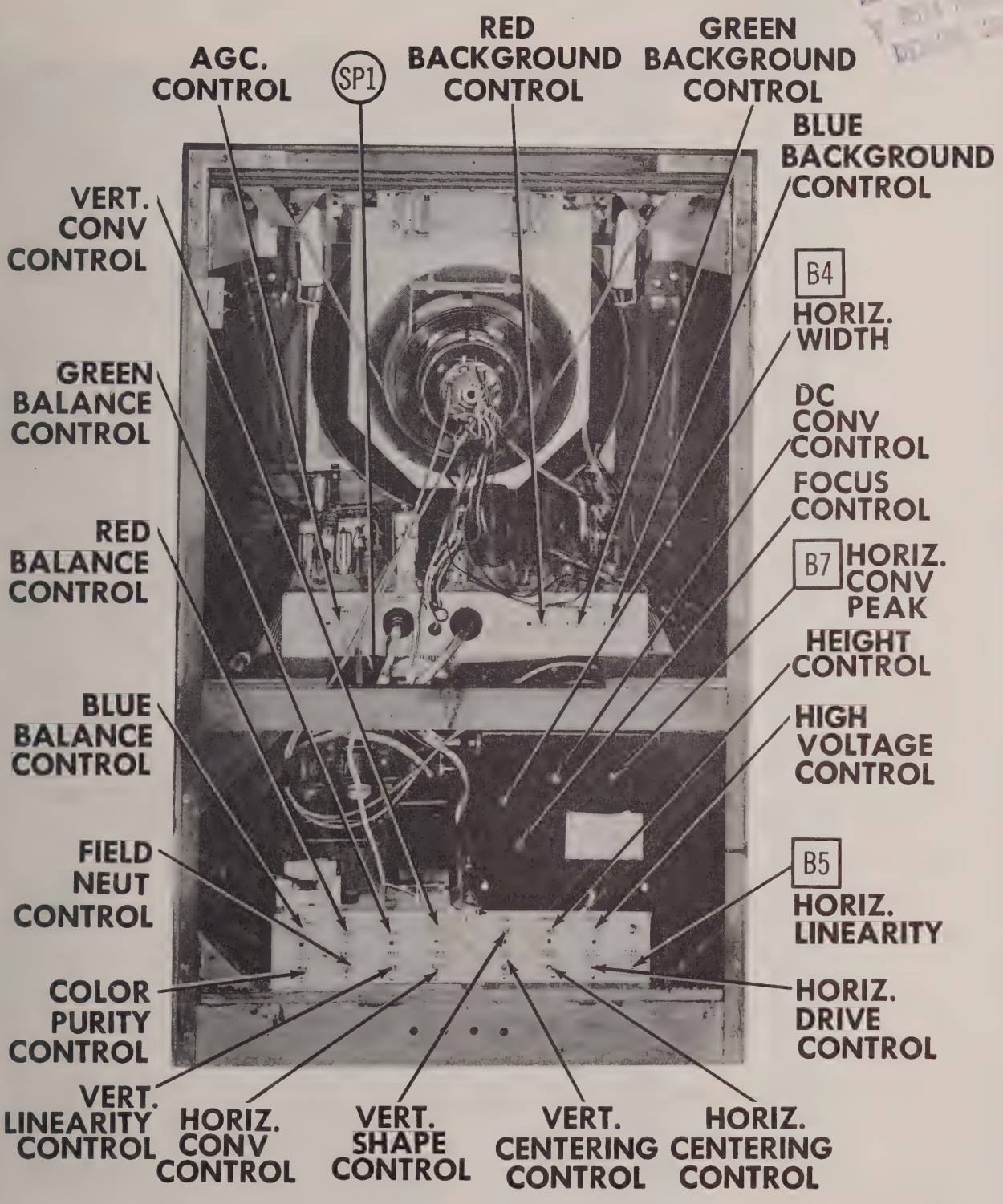
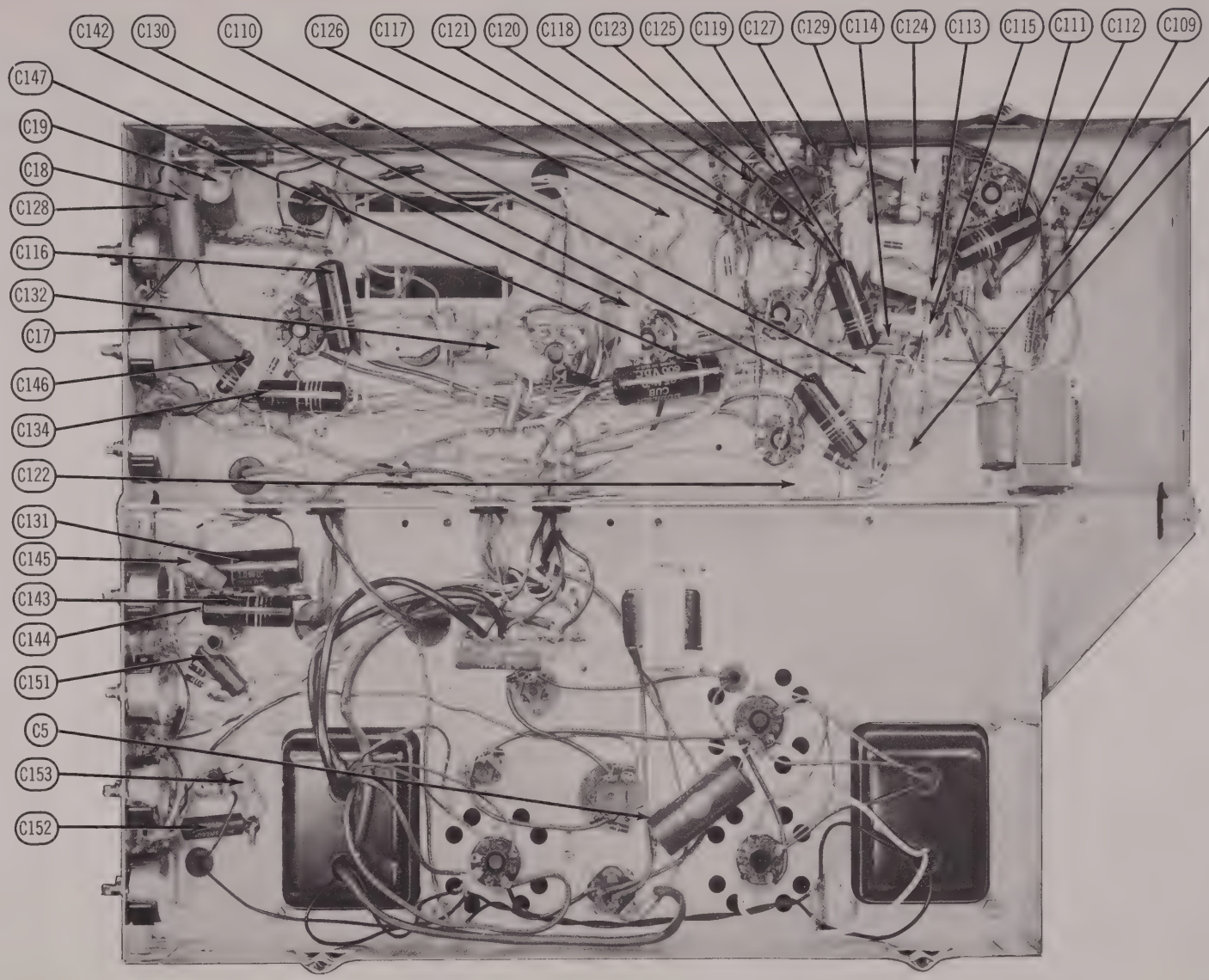



**RF-IF CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION (C7-C107)**




CABINET-REAR VIEW

SET 299 FOLDER 9

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L. F. [illegible] SHIP.
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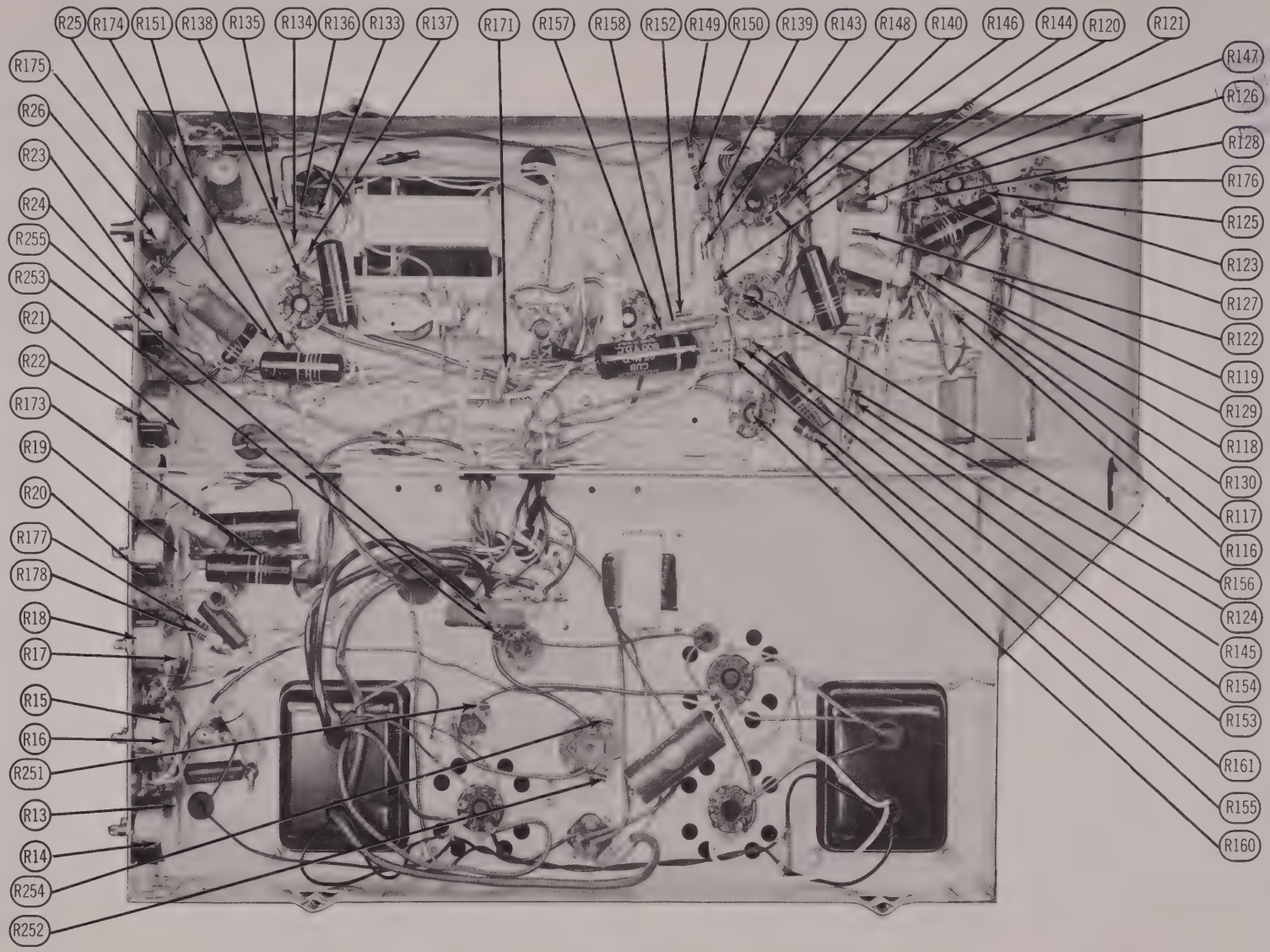
DENVER, COLORADO

SWEEP CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION




SWEEP CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

# MISCELLANEOUS ADJUSTMENTS

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a TV station, preferably a test pattern.

If unable to synchronize the picture with the horizontal hold control (R3A), set it at its mid-range position and adjust the horizontal frequency slug (B4) until the picture synchronizes horizontally. If unable to sync the picture horizontally continue with "Horizontal Oscillator Waveform Adjustment."

HORIZONTAL OSCILLATOR WAVEFORM ADJUSTMENT

Connect the vertical amplifier of the oscilloscope thru a 10MMF to terminal "C" of L39. Low side to chassis. Adjust the horizontal hold control (R3A) one quarter turn from its maximum clockwise position. Adjust the waveform slug (B2) until waveform similar to Fig. 3 is obtained. While making this adjustment keep the picture in sync with R3A and if necessary B1. Remove the oscilloscope from terminal "C" of L39.

HORIZONTAL LOCKING RANGE ADJUSTMENT

Set the horizontal hold control (R3A) fully counter clockwise. Picture should remain in sync. Momentarily remove signal by switching off channel and back again. If picture does not fall out of sync adjust B1 until picture falls out of sync when switching off channel and back again. Adjust R3A clockwise and note the number of diagonal bars present as picture falls into sync.

If more than three bars are present, adjust the horizontal locking range trimmer (B3) slightly clockwise. If less than 2 bars are present, adjust B3 counter clockwise. Repeat the above procedure until the correct (2 or 3) number of bars are present. Adjust R3A fully clockwise. Adjust B1 until the diagonal bars slope to the right and then readjust B1 back until the picture just falls into synchronization.

In weak signal areas the horizontal hold should be adjusted so that when switching off channel and back again the picture returns completely in sync. Adjust the horizontal drive control (R26) to eliminate any compression or a white vertical line near center of the screen.

Adjust the horizontal width coil (B4) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity coil (B5) for a picture that is symmetrical from left to right.

COLOR CIRCUIT ALIGNMENT

Connect a NTSC color bar signal generator to the receiver antenna terminals. Set the tuner, color saturation control and the color phase trimmer for color bars on the screen. Set the color hold control (R5) at its mid-range position. Adjust A28 until the color bars on the screen are synchronized.

Connect the RF probe of a VTVM to point (F). Common side to point (B). Remove V6 from its socket and disconnect color bar generator from antenna terminals. Set the color saturation control for minimum. Adjust A29 for maximum deflection. If two peaks occur when adjusting A29 use the one with slug nearest the chassis. Adjust A30 for minimum reading on VTVM.

Set the color phase trimmer, color saturation control and color hold control at their mid-range positions. Connect a 5000MMF capacitor from pin 5 of V35 to pin 3 of V8A. Connect the RF probe of VTVM to point (G). Common to point (B). Adjust A31 for minimum deflection on VTVM. Move the RF probe of VTVM to pin 1 (Cathode) of 6AL5 (V33). Adjust A32 for maximum deflection on VTVM. Remove capacitor from pin 5 of V35 and pin 3 of V8A.

Connect the high side of a RF signal generator thru a .1MFD to pin 3 of V8A. Low side to point (B). Adjust signal generator for 4.5MC.

Connect the RF probe of VTVM to point (D). Common to point (B). Adjust A33 for minimum deflection on VTVM.

Remove 12AT7 (V34) from its socket. Replace V6 in its socket. Connect sweep generator thru a .015 MFD to point (A). Low side to chassis. Couple marker generator loosely to sweep generator thru a 2-5MFD capacitor. Connect the vertical amplifier of an oscilloscope thru a detector (Fig. 4) to point (D). Low side to chassis. Adjust the contrast and color saturation control for maximum position. Use enough sweep generator output for useable pattern on scope. Set sweep generator for 0-5MC sweep and marker generator for frequencies of 2.0MC, 2.5MC, 3.5MC, 4.0MC, and 4.5MC. Adjust A34, A35 and A36 for response curve similar to Fig. 5.

Set the demodulator gain control (R10) at its mid-range position. Connect the high side of sweep generator thru a .1MFD capacitor to point (E). Low side to chassis. Connect the vertical amplifier of scope thru probe (Fig. 4) to pin 18 (grid) of V44. Low side to chassis.

Loosely couple marker generator to sweep generator output. Sweep from 0-2MC. Adjust A37 and A38 for response similar to Fig. 6A.

Move scope connection to pin 3 (grid) of V44. Adjust A39 and A40 for response similar to Fig. 6B. Connect scope to pin 8 (grid) of V44. Adjust A41 and if necessary, slightly retouch A40 for response similar to Fig. 6C. Repeat adjustments A37 thru A41 until satisfactory response curves similar to Fig. 6A, 6B and 6C are obtained. Replace V34 in its socket.

R-Y-B-Y BALANCE ADJUSTMENTS

Connect a color signal generator, providing aR-Y and aB-Y signals across the antenna terminals. Connect the vertical amplifier of the oscilloscope to pin 5 (cathode) of 6AL5 (V30B). Connect low side to chassis. Adjust the color phase trimmer control for zero B-Y signal indication on scope.

Move the scope connection to pin 5 cathode of (V40B). Adjust A30 for zero R-Y signal indication on scope. Move scope back to pin 5 of V30B and recheck zero indication of B-Y signal on scope. Repeat adjustments of color phase trimmer control and A30 until proper balance of R-Y and B-Y are obtained.

AGC THRESHOLD CONTROL ADJUSTMENT

Tune in a TV station with a test pattern. Connect the vertical input lead of an oscilloscope thru a 10KΩ to point (A). Low side to point (B). Adjust the AGC threshold control (R6) to obtain 3.5 volts peak to peak on oscilloscope.

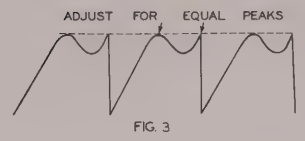


FIG. 3

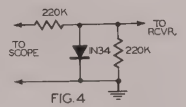


FIG.4

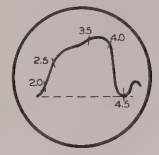


FIG. 5

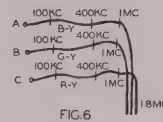


FIG.6

RECEIVER SET-UP ADJUSTMENTS

Set contrast control (R2) fully counter clockwise. Set the master brightness control (R4A) fully counter clockwise.

Set the color saturation control switch (R4B, C) to off position.

Set the high voltage control (R25) at its mid-range position.

Set the red (R7), green (R8), and blue (R9) background controls to their minimum position.

Set the horizontal convergence control (R20), vertical convergence control (R19), color purity control (R14), the green balance control (R17) and the blue balance control (R15) at their minimum positions.

Set the red balance control (R15) and the field neutralising control R16 at their mid-range positions.

Turn off receiver and connect the probe end of a high voltage probe through a short length of high voltage anode lead to the plate of the high voltage regulator tube (6SD4/V29). Slightly raise the cap on top of the tube to make this connection. Turn the set on, adjust the master brightness control (R4A) and the green background control (R8) for brightness on the screen of picture tube.

Adjust the focus control (R12) for best focus in the center portion of the screen. Adjust the high voltage control (R25) for 20KV. Turn R4A throughout its range, if more than a slight voltage change occurs, slightly readjust R25.

COLOR PURITY ADJUSTMENT

Set the channel selector switch between any two channels.

For pre-setting of controls refer to "Receiver Set-up Adjustments".

Set the 3 beam positioning magnets located over neck of picture tube fully counter clockwise.

Set the red background control (R7) at maximum position. Adjust the master brightness control (R4A) for a bright red screen. Alternately rotate the purity coil (T9) and adjust the color purity control (R14) until red screen purity is obtained. Slide the yoke mounting to the rear as far as possible, then slide forward until maximum red screen purity is obtained. Recheck adjustments of T9 and R4 for maximum red purity. Check the blue screen purity by turning the blue background control (R9) for maximum and the red and green background controls for minimum. Check the green screen purity by tuning green background control (R8) for maximum and the red and blue background controls for minimum. Set the contrast control (R2) fully counter clockwise. Set the master brightness control (R4A) at its mid-range position. Adjust red, blue and green background controls for a low brightness white raster.

DC CONVERGENCE ADJUSTMENTS

Connect the RF output of a white dot generator across the antenna terminals. Set tuner to correct channel. Turn the horizontal and vertical dynamic convergence controls (R19, R20) for minimum. Set the DC convergence control (R11) and the vertical convergence shape at their mid-range position. Position the convergence magnets until the red, blue and green dots of a dot triad near the center of the screen are super imposed on each other forming a single white dot. Frequent readjustment of the focus and DC convergence controls may be necessary while positioning the convergence magnets due to interaction. Final positioning of the convergence magnets should not leave them too close to the neck of the picture tube or beam focus distortion may result.

DYNAMIC CONVERGENCE ADJUSTMENTS

Leave the white dot generator connected as under "DC Convergence Adjustments".

Turn the DC convergence control and the focus control for a small triangle of dots near the center of the screen. Set the horizontal dynamic convergence control for maximum. Connect the vertical amplifier of an oscilloscope to pin 2 (plate) of 6BL7 (V30B). Low side to chassis. Adjust the horizontal convergence phase slug B6 and horizontal convergence peaking slug B7 for maximum positive peaks on scope.

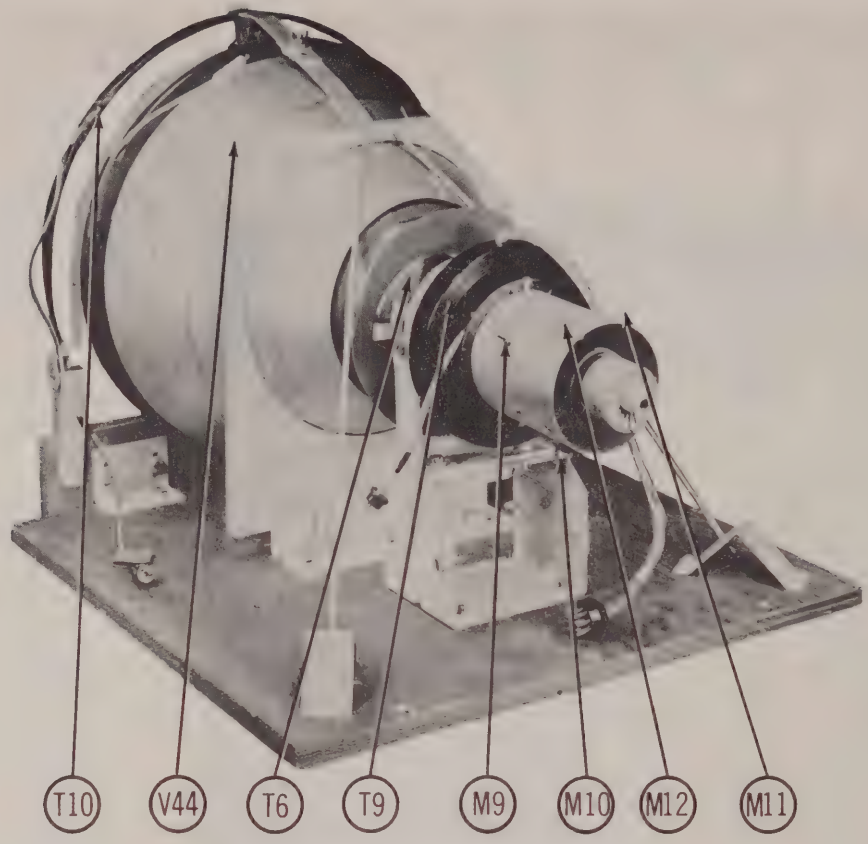
Adjust the horizontal dynamic convergence control and if necessary, B6 until a horizontal line near the center of the screen show an equal displacement from left to right. Readjust the DC convergence control until the dots along this line converge to form a single line of white dots. Readjust the focus to obtain best detail of dots.

Turn the vertical convergence control so that the dots along a vertical line show equal dot displacement from top to bottom of center line. If equal dot displacement does not occur on the vertical center line adjust the vertical convergence shape control to obtain the most uniform dot displacement. If necessary, readjust the vertical convergence control. Readjust the DC convergence control so that the dots converge to form white dots along the vertical line near center of the screen. Adjust the focus control to keep dots in focus. Slight readjustment of the vertical convergence and vertical convergence shape control may be required to obtain best vertical convergence. Recheck color purity, if necessary touch up purity adjustments. (Refer to "Color Purity Adjustments") Then repeat horizontal and vertical convergence adjustments.

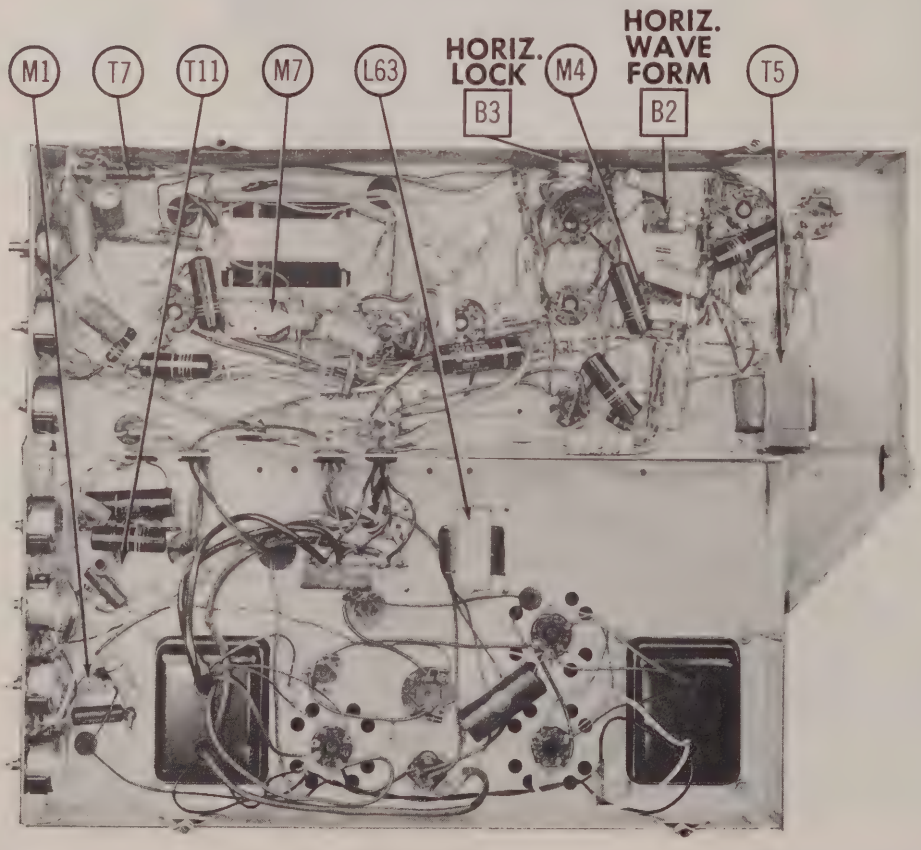
WHITE ADJUSTMENT

Disconnect white dot generator from antenna terminals. Turn the color saturation control to off position. Set master brightness and contrast control for best black and white screen. Tune in a black and white picture. Adjust the red, blue, and green background controls to obtain low brightness white, (grey).

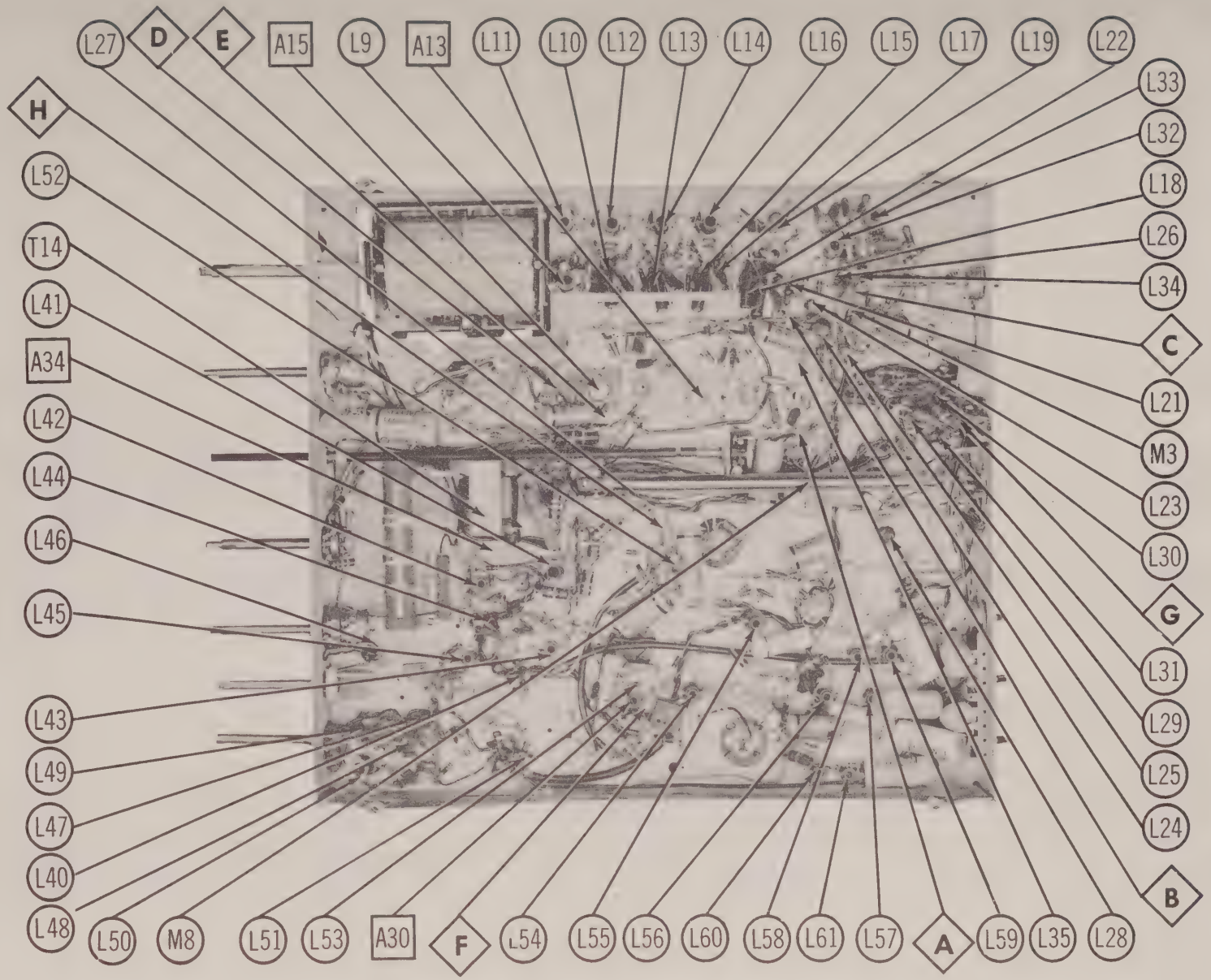
Increase screen brightness and adjust the red, blue, and green balance controls until the brightness highlights in the picture are white. Turn the brightness control for a reduced setting. Adjust red, blue, and green background and balance controls, if necessary, until the low brightness portions are white. Recheck the highlight portions and obtain best compromise of control adjustments for a black and white picture.




PICTURE TUBE ASSEMBLY




SWEEP CHASSIS BOTTOM VIEW TRANS., INDUCTOR & ALIGN. IDENT.




RF-IF CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

16A211 (Ch. CTV-2)

SPARTON MODEL

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No. | USE | REPLACEMENT DATA | | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| | | SPARTON PART No. | STANDARD REPLACEMENT | | |
| V1 | RF Amplifier | 6BZ7 | 6BZ7 | 9AJ | 6BQ7 used as alternate |
| V2 | Osc.-Mixer | 6J6 | 6J6 | 7BF | |
| V3 | 1st. Video IF Amp. | 6CB6 | 6CB6 | 7CM | |
| V4 | 2nd. Video IF Amp. | 6BA6 | 6BA6 | 7BK | |
| V5 | 3rd. Video IF Amp. | 6BA6 | 6BA6 | 7BK | |
| V6 | 4th. Video IF Amp. | 6CB6 | 6CB6 | 7CM | |
| V7 | Video Detector-Sync Limiter | 6AL5 | 6AL5 | 6BT | |
| V8 | Video Cathode Follower - Sync Amplifier | 12AU7 | 12AU7 | 9A | |
| V9 | Video Output | 6CL6 | 6CL6 | 9BV | |
| V10 | AGC Rectifier-Sync Amplifier | 12AU7 | 12AU7 | 9A | |
| V11 | AGC Amplifier-Chroma Amp. | 12AU7 | 12AU7 | 9A | |
| V12 | 1st. Sound IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V13 | 2nd. Sound IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V14 | 3rd. Sound IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V15 | Ratio Det. | 6AL5 | 6AL5 | 6BT | |
| V16 | AF Amplifier-AGC Clamper | 6AT6 | 6AT6 | 7BT | |
| V17 | Audio Output | 6AQ5 | 6AQ5 | 7BZ | |
| V18 | Sync Separator-Sync Cathode Follower | 12AU7 | 12AU7 | 9A | |
| V19 | Vert. Oscillator-Vert. Output | 6BL7GT | 6BL7GT | 8BD | |
| V20 | Protection Amp.-Convergence Amp. | 6BL7GT | 6BL7GT | 8BD | |
| V21 | Horiz. AFC-Horiz. Osc. | 6SN7GT | 6SN7GT | 8BD | |
| V22 | Horiz. Output | 6BG6G | 6BG6G | 5BT | |
| V23 | Horiz. Output | 6BG6G | 6BG6G | 5BT | |
| V24 | Damper | 6AU4GT | 6AU4GT | 4CG | |
| V25 | Focus Rectifier | 3A3 | 3A3 | 3C | |
| V26 | HV Rectifier | 3A3 | 3A3 | 3C | |
| V27 | Diode Coupler | 3A3 | 3A3 | 3C | |
| V28 | HV Doubler | 3A3 | 3A3 | 3C | |
| V29 | HV Regulator | 6BD4 | 6BD4 | | |
| V30 | Burst Amp. Keying-R-Y DC Restorer | 6AL5 | 6AL5 | 6BT | |
| V31 | Chroma Bandpass Amplifier | 6CB6 | 6CB6 | 7CM | |
| V32 | Burst Amplifier | 6AH6 | 6AH6 | 7BK | |
| V33 | Chroma Sync-Phase Det. | 6AL5 | 6AL5 | 6BT | |
| V34 | Chroma Ref. Osc.-Chroma Ref. Osc. Control | 12AT7 | 12AT7 | 9A | |
| V35 | Quadrature Amp. | 6CB6 | 6CB6 | 7CM | |
| V36 | R-Y Demod. | 6AS6 | 6AS6 | 7CM | |
| V37 | B-Y Demod. | 6AS6 | 6AS6 | 7CM | |
| V38 | R-Y Amp.- R-Y Matrix Amp. | 12AU7 | 12AU7 | 9A | |
| V39 | B-Y Amp.-B-Y Matrix Amp. | 12AU7 | 12AU7 | 9A | |
| V40 | G-Y DC Restorer-B-Y DC Restorer | 6AL5 | 6AL5 | 6BT | |
| V41 | LV Rectifier | 5Y3GT | 5Y3GT | 5T | |
| V42 | LV Rectifier | 5U4G | 5U4G | 5T | |
| V43 | LV Rectifier | 5U4G | 5U4G | 5T | |

## CATHODE-RAY TUBE

| ITEM No. | REPLACEMENT DATA | | | | | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|---|---|
| | SPARTON PART No. | CBS PART No. | GENERAL ELECTRIC PART No. | SYLVANIA PART No. | WESTINGHOUSE PART No. | | |
| V44 | 15GP22 | | | 15GP22 | | | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | SPARTON PART No. | MALLORY PART No. | PYRAMID PART No. | SANGAMO PART No. | |
| C1A | ■40 | 250 | | FP376.8 | TM-404010-450 | T-355 | |
| B | ●40 | 250 | | | | | |
| C | ▲10 | 200 | | | | | Note 1 |
| C2 | 80 | 250 | | FP128 | TM-80-250 | S-155 | |
| C3 | 80 | 250 | | FP128 | TM-80-250 | S-155 | |
| C4A | ●80 | 250 | | FP227.6 | TM-D80-300 | D-145 | |
| B | ▲80 | 250 | | | | | |
| C5 | 40 | 250 | | TC58 | TD-40-250 | FM-2540 | |
| C6 | 20 | 350 | | TC65 | TD-20-350 | FM-4520 | |
| C7 | 5 | 50 | | TC30 | TD-5-50 | MMT-0505 | |
| C8 | 10 | 450 | | TC72 | TD-10-450 | FM-4510 | |
| C9 | 500 | 3 | | WP505 | TD-500-6 | MTH-0650 | |
| C10A | ▲10 | 200 | | FP376.8 | TM-404010-450 | D-130 | |
| B | ●40 | 250 | | | | | |
| C | ■40 | 250 | | | | | |
| C11A | ▲40 | 475 | | FP262 | TM-D40-500 | D-265 | |
| B | ●40 | 475 | | | | | |
| C12 | 5 | 50 | | TC30 | TD-5-50 | MMT-0505 | |
| C13A | ●80 | 450 | | FP368.3 | TM-3057 | T-715 | |
| B | ▲20 | 50 | | | TD-25-50 | | |
| C | ■100 | 50 | | | | | Note 2 |
| C14A | ■10 | 450 | | FP377.4 | TM-6020-450 | Q-060 | |
| B | ●60 | 450 | | | TD-10-50 | | |
| C | ▲10 | 50 | | | | | |
| C15 | 2 | 50 | | TC302 | TD-2-50 | MMT-0505 | |
| C16A | ▲1000 | 15 | | WP200 | TM-D1000-15 | D-015 | |
| B | ●1000 | 15 | | | | | |
| C17 | 25 | 25 | | TC26 | TD-25-25 | FM-0225 | |
| C18 | 25 | 25 | | TC26 | TD-25-25 | FM-0225 | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CAPACITORS (cont)

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA SPARTON PART No. | MALLORY PART No. | PYRAMID PART No. | SANGAMO PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C19 | 25 | 25 | | TC26 | TD-25-25 | FM-0225 | |
| C20 | 8 | 150 | | TC41 | TD-8-150 | FM-1508 | |
| C21 | 30 | 150 | | TC47 | TD-30-150 | FM-1530 | |
| C22 | 50 | 50 | | TC39 | TD-50-50 | FM-0550 | |
| C23 | 25 | 25 | | TC26 | TD-25-25 | FM-0225 | |
| C24 | 25 | 25 | | TC26 | TD-25-25 | FM-0225 | |

Note 1. C1C is not used.
Note 2. C13C is not used.

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## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA SPARTON PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C25 | 3-9 | | | 829-10 | | | |
| C26 | 800 | | | MFT-1000 | | | |
| C27 | 3 | | | TCZ-3R3 | NP0A-030 | ZT-5533 | |
| C28 | .5-3 | | | 829-3 | 3115-01-0R5 | CT565A | |
| C29 | 1.5 | | | TCZ-1R5 | NP0A-1R5 | ZT-5515 | |
| C30 | 800 | | | MFT-1000 | | | |
| C31 | 47 | | | DD-470 | 831-470 | UC-5447 | |
| C32 | 1000 | | | DD-102 | 801-001 | DC-521 | |
| C33 | 800 | | | MFT-1000 | | | |
| C34 | 47 | | | DD-470 | 831-471 | UC-5447 | |
| C35 | .5-3 | | | 829-3 | 3115-01-0R5 | CT565A | |
| C36 | 10 | | | TCZ-10 | NP0K-100 | ZT-541 | |
| C37 | 5 | | | | | | |
| C38 | 1000 | | | DD-102 | 801-001 | DC-521 | |
| C39 | 6.8 | | | TCZ-6R8 | NP0A-6R8 | ZT-5568 | |
| C40 | 120 | | | DD-121 | 811-121 | UC-5312 | |
| C41 | 800 | | | MFT-1000 | | | |
| C42 | 800 | | | MFT-1000 | | | |
| C43 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C44 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C45 | 6.8 | | | TCZ-6R8 | NP0A-6R8 | ZT-5568 | |
| C46 | 100 | | | TCZ-100 | NP0-337-101 | ZT-531 | |
| C47 | 1000 | | | D6-102 | GP2L-102 | UC-521 | |
| C48 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C49 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C50 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C51 | 5000 | | | DD-502 | 811-005 | DC-525 | Note 3 |
| C52 | 3.3 | | | TCZ-3R3 | NP0A-3R3 | ZT-5533 | |
| C53 | 100 | | | TCZ-100 | NP0-337-101 | ZT-531 | |
| C54 | 270 | | | D6-271 | GP2K-271 | UC-5327 | |
| C55 | 1000 | | | D6-102 | GP2L-102 | UC-521 | |
| C56 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C57 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C58 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C59 | 270 | | | D6-271 | GP2K-271 | UC-5327 | |
| C60 | 1000 | | | D6-102 | GP2L-102 | UC-521 | |
| C61 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C62 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C63 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C64 | 270 | | | D6-271 | GP2K-271 | UC-5327 | |
| C65 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C66 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C67 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C68 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C69 | 6.8 | | | TCZ-6R8 | NP0A-6R8 | ZT-5568 | |
| C70 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C71 | 4.7 | | | TCZ-4R7 | NP0A-4R7 | ZT-5547 | |
| C72 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C73 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C74 | .1 | 200 | | DF-104 | | PT401 | |
| C75 | 68 | 500 | | TCZ-68 | NP0-337-680 | ZT-5468 | |
| C76 | .47 | 200 | | | | PT4047 | |
| C77 | .047 | 400 | | DF-503 | | PT4147 | |
| C78 | .1 | 200 | | DF-104 | | PT401 | |
| C79 | 470 | 500 | | D6-471 | 811-471 | MCB245 | |
| C80 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C81 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C82 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C83 | 4.7 | | | TCZ-4R7 | NP0A-4R7 | ZT-555 | |
| C84 | 100 | | | TCZ-100 | NP0-337-101 | ZT-531 | |
| C85 | 47 | | | TCZ-47 | NP0-338-470 | ZT-5447 | |
| C86 | 10 | 500 | | TCZ-10 | NP0K-100 | MCE215 | |
| C87 | 4.7 | | | TCZ-4R7 | NP0A-4R7 | ZT-555 | |
| C88 | 68 | 500 | | TCZ-68 | NP0-337-680 | ZT-5468 | |
| C89 | 100 | | | TCZ-100 | NP0-337-101 | ZT-531 | |
| C90 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C91 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C92 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C93 | 33 | 500 | | TCZ-33 | NP0K-330 | ZT-5433 | |
| C94 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C95 | 120 | | | TCZ-121 | NP0-333-121 | | |
| C96 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C97 | 1000 | | | D6-102 | GP2L-102 | UC-521 | |
| C98 | .022 | 400 | | DF-203 | 817-02 | PT4122 | |
| C99 | .033 | 200 | | DF-303 | | PT4133 | |
| C100 | .01 | 400 | | D6-103 | GP2-333-103 | PT411 | |
| C101 | .022 | 600 | | DF-203 | 817-02 | PT6122 | |
| C102 | .0047 | 600 | | D6-472 | GP2-333-472 | PT6247 | |
| C103 | 68 | 500 | | D6-680 | GP1K-680 | UC-5468 | |
| C104 | .047 | 400 | | DF-503 | | PT4147 | |
| C105 | 1000 | | | D6-102 | GP2L-102 | UC-521 | |
| C106 | .047 | 400 | | DF-503 | | PT4147 | |
| C107 | 100 | | | TCZ-100 | NP0-337-101 | ZT-531 | |
| C108A | 5600 | | | D6-562 | | | |
| B | 5600 | | | D6-562 | | | |
| C | 15000 | | | DD16-153 | | | |
| C109 | 7000 | 500 | | | | MCB469 | |
| C110 | .1 | 400 | | | | | |
| C111 | .22 | 400 | | | | PT4022 | |
| C112 | 470 | 500 | | D6-471 | 811-471 | MCB245 | |

## CAPACITORS (cont)

| ITEM No | RATING CAP | RATING VOLT | REPLACEMENT DATA SPARTON PART No | CENTRALAB PART No | ERIE PART No. | MALLORY PART No | NOTES |
|---|---|---|---|---|---|---|---|
| C113 | .047 | 400 | | DF-503 | | PT4147 | |
| C114 | .047 | 400 | | DF-503 | | PT4147 | |
| C115 | .01 | 600 | | DS-103 | GP2-333-103 | PT611 | |
| C116 | .47 | 200 | | | | PT4047 | |
| C117 | 82 | 500 | | DS-820 | GP1K-820 | | |
| C118 | 82 | 500 | | DS-820 | GP1K-820 | | |
| C119 | .47 | 200 | | | | PT4047 | |
| C120 | .01 | 600 | | DS-103 | GP2-333-103 | PT611 | |
| C121 | 82 | 500 | | DS-820 | GP1K-820 | | |
| C122 | .1 | 400 | | DF-104 | | PT401 | |
| C123 | 270 | 500 | | TCZ-270 | NP0-335-271 | MCE241 | |
| C124 | .01 | 600 | | | | | |
| C125 | 12 | 500 | | TCZ-12 | NP0K-120 | | |
| C126 | .1 | 600 | | DF-104 | | PT601 | |
| C127 | 1200 | 500 | | | | | |
| C128 | .047 | 600 | | DF-503 | | PT4147 | |
| C129 | .01 | 600 | | DS-103 | GP2-333-103 | PT611 | |
| C130 | .22 | 400 | | | | PT4022 | |
| C131 | 1.0 | 200 | | | | PT41 | |
| C132 | .068 | 400 | | | | | |
| C133 | .5 | 400 | | | | PT405 | |
| C134 | .082 | 600 | | | | | |
| C135 | .022 | 600 | | DF-303 | 817-02 | PT6122 | |
| C136 | 250 | 2000 | | | | | |
| C137 | 1200 | 15000 | | | | | |
| C138 | 10000 | 6000 | | | | | |
| C139 | 1200 | 15000 | | | | | |
| C140 | 1200 | 15000 | | | | | |
| C141 | 2000 | 30000 | | | | | |
| C142 | .01 | 600 | | DS-103 | GP2-333-103 | PT611 | |
| C143 | .22 | 400 | | | | PT4022 | |
| C144 | .0033 | 400 | | DS-332 | GP2-333-332 | PT6233 | |
| C145 | 4700 | 500 | | | | MCB465 | |
| C146 | .0033 | 400 | | DS-332 | GP2-333-332 | PT6233 | |
| C147 | .25 | 600 | | | | PT6025 | |
| C148 | 1000 | 10000 | | | | | |
| C149 | 1000 | 10000 | | | | | |
| C150 | 500 | 20000 | | TV3-502 | 413 | HV20035A | |
| C151 | .022 | 600 | | DF-303 | 817-02 | PT6122 | |
| C152 | .022 | 600 | | DF-303 | 817-02 | PT6122 | |
| C153 | .022 | 600 | | DF-303 | 817-02 | PT6122 | |
| C154 | 10000 | | | DD-103 | 811-01 | DC-511 | |
| C155 | 180 | 500 | | TCZ-180 | NP0-334-181 | MCE227 | |
| C156 | 100 | | | TCZ-100 | NP0-337-101 | ZT-531 | |
| C157 | .047 | 400 | | DF-503 | | PT4147 | |
| C158 | 3-12 | | | 822-FZ | TS2A-3 | ET-553-Z | |
| C159 | 300 | 500 | | TCZ-300 | NP0-335-301 | MCE241 | |
| C160 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C161 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C162 | 10000 | | | DD-103 | 811-01 | DC-511 | |
| C163 | 1000 | | | D6-102 | GP2L-102 | UC-521 | |
| C164 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C165 | 47 | | | TCZ-47 | NP0-338-470 | ZT-5447 | |
| C166 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C167 | .15 | 200 | | | | PT4015 | |
| C168 | 10000 | | | DD-103 | 811-01 | DC-511 | |
| C169 | 100 | | | TCZ-100 | NP0-337-101 | ZT-531 | |
| C170 | 33 | 500 | | TCZ-33 | NP0L-330 | ZT-5433 | |
| C171 | 2200 | | | D6-222 | GP2-333-222 | UC-5222 | |
| C172 | 2200 | | | D6-222 | GP2-333-222 | UC-5222 | |
| C173 | 100 | | | TCZ-100 | NP0-337-101 | ZT-531 | |
| C174 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C175 | 2.2 | | | TCZ-2R2 | NP0A-2R2 | | |
| C176 | 10000 | | | DD-103 | 811-01 | DC-511 | |
| C177 | 2400 | 500 | | | | MCB460 | |
| C178 | 10000 | | | DD-103 | 811-01 | DC-511 | |
| C179 | 47 | | | TC4-47 | N330L-470 | | |
| C180 | 300 | 500 | | TCZ-300 | NP0-335-301 | MCE241 | |
| C181 | 300 | 500 | | TCZ-300 | NP0-335-301 | MCE241 | |
| C182 | 33 | | | TCZ-33 | NP0L-330 | ZT-5433 | |
| C183 | 1-12 | | | | | | |
| C184 | 220 | 500 | | TCZ-220 | NP0-335-221 | MCE240 | |
| C185 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C186 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C187 | 1500 | 500 | | | 811-153 | MCB256 | |
| C188 | 240 | 500 | | TCZ-240 | NP0-335-241 | MCE240 | |
| C189 | 180 | 500 | | TCZ-180 | NP0-334-181 | MCE237 | |
| C190 | 4.5-25 | | | 822-AZ | | | |
| C191 | .1 | 200 | | DF-104 | | PT401 | |
| C192 | 1000 | | | D6-102 | GP2L-102 | UC-521 | |
| C193 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C194 | 10000 | | | DD-103 | 811-01 | DC-511 | |
| C195 | .1 | 400 | | DF-104 | | PT401 | |
| C196 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C197 | 5000 | | | DD-502 | 811-005 | DC-525 | |
| C198 | .1 | 400 | | DF-104 | | PT401 | |
| C199 | .22 | 200 | | | | PT4022 | |
| C200 | .22 | 200 | | | | PT4022 | |
| C201 | .47 | 200 | | | | PT4047 | |
| C202 | .47 | 200 | | | | PT4047 | |
| C203 | .47 | 200 | | | | PT4047 | |
| C204 | .47 | 200 | | | | PT4047 | |
| C205 | .47 | 200 | | | | PT4047 | |
| C206 | .47 | 200 | | | | PT4047 | |

Note 3. Not used in some versions.

# PARTS LIST AND DESCRIPTIONS (Continued)

## CONTROLS

| ITEM No | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA SPARTON PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 1Meg | ½ | PA4450-6 | QJ-810† | | F1-55 | UF16L | Tone (Panel) |
| B | 330KΩ | ½ | | | | R3-38 | UR354-T74 | Volume (Rear)Attach to R1A. Tapped at 68K. |
| C | Switch | | | | | KB-1 | UB-26 | Attach to R1B. |
| R2A | 1000Ω | 2 | PA4453 | WK-1000 | A43-1000 | V-129 | R1000L | Contrast (Wire Wound) |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | DS-36 | Attach to R2A. |
| R3A | 50KΩ | ½ | PA4456-1 | eQJ-431 | RTV-504 | F1-39 | UF54L } ** | Horizontal Hold (Panel) |
| B | 1Meg | ½ | | | | R3-51 | UR16L } | Vertical Hold (Rear). Attach to R3A. |
| R4A | 50KΩ | ½ | | | | F1-39 | UF54L | Master Brightness (Panel) |
| B | 10KΩ | ½ | | | | R2-33 | UR14L | Color Saturation (Rear). Attach to R4A. |
| C | Switch | | | | | KB-1 | US-26 | Attach to R4B. |
| R5A | 750Ω | ½ | CAEX13675A | Q11-103 | A47-500-S | B-4 | U-2 | Color Hold |
| B | Shaft | | | C-3 | FS-3 | Not Req. | | Attach to R5A. |
| R6A | 200KΩ | ½ | | Q11-139 | A47-200K-S | AB-46 | U-43 | AGC Threshold |
| B | Shaft | | | SQ | FKS-1/4 | AK-1 | Not Req. | Attach to R6A. |
| R7A | 1Meg | ½ | PA4443 | Q11-137 | A47-1Meg-S | B-89 | U-54 | Red Background |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R7A. |
| R8A | 1Meg | ½ | PA4443 | Q11-137 | A47-1Meg-S | B-89 | U-54 | Green Background |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R8A. |
| R9A | 1Meg | ½ | PA4443 | Q11-137 | A47-1Meg-S | B-89 | U-54 | Blue Background |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R9A. |
| R10A | 1000Ω | ½ | PA4434 | Q11-108 | A47-1000-S | AB-5 | DU-8 | Demodulator Gain |
| B | Shaft | | Not Req. | SQ | FKS-1/4 | AK-1 | Not Req. | Attach to R10A. |
| R11 | 15Meg | | | | | | | D. C. Convergence |
| R12 | 5Meg | | | | | | | Focus |
| R13A | 5Meg | ½ | | Q11-141 | A47-5Meg-S | AB-87 | SU-67 | Blue Balance |
| B | Shaft | | | SQ | FKS-1/4 | AK-1 | Not Req. | Attach to R13A |
| R14A | 200Ω | 2 | | W-30 | A43-30 | VK-112 | R30L | Color Purity (Wire Wound) |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | Attach to R14A. |
| R15A | 5Meg | ½ | | Q11-141 | A47-5Meg-S | AB-87 | SU-67 | Red Balance |
| B | Shaft | | | SQ | FKS-1/4 | AK-1 | Not Req. | Attach to R15A. |
| R16 | 30Ω | 2 | | W30X15 | RTV-15 | SVT-903 | R30-CT | Field Neutralizing (Wire Wound) Center Tapped |
| R17A | 5Meg | ½ | | Q11-141 | A47-5Meg-S | AB-87 | SU-67 | Green Balance |
| B | Shaft | | | SQ | FKS-1/4 | AK-1 | Not Req. | Attach to R17A. |
| R18A | 5000Ω | 2 | PA4411 | WK-5000 | A43-5000 | VK-128 | R5000L | Vertical Linearity (Wire Wound) |
| B | Shaft | | Not Req. | Not Req. | FKS-1/4 | Not Req. | Not Req. | Attach to R18A. |
| R19A | 10KΩ | ½ | | Q11-116 | A47-10K-S | B-14 | U-30 | Vertical Convergence |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R19A. |
| R20A | 100Ω | 2 | | W-100 | A43-100 | VK-121 | R100L | Horizontal Convergence (Wire Wound) |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | Attach to R20A. |
| R21A | 5Meg | ½ | | Q11-141 | A47-5Meg-S | AB-87 | SU-67 | Vertical Convergence Shape |
| B | Shaft | | | RQ | FKS-1/4 | AK-1 | Not Req. | Attach to R21A. |
| R22 | 20Ω | 2 | | W20X10 | RTV-98 | SVT-901 | R20-CT | Vert. Centering(wire wound) CT |
| R23A | 1Meg | ½ | PA4443 | Q11-137 | A47-1Meg-S | B-89 | U-54 | Height |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R23A. |
| R24 | 80Ω | 2 | | | RTV-339 | | | Horiz. Centering(wire wound) CT |
| R25A | 1Meg | ½ | PA4443-3 | Q11-137 | A47-1Meg-S | B-89 | U-54 | High Voltage |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R25A. |
| R26A | 100KΩ | ½ | CAEX13681 | | A47-100K-S | AB-40 | SU-61 | Horizontal Drive |
| B | Shaft | | | | FS-2 | AK-1 | Not Req. | Attach to R26A. |

*CONCENTRIKIT EQUIVALENT: K-2 KIT, BASE ELEMENTS & SHAFTS: Bil-123, P2-226, (Panel) Bil-137, Ri-308 (Rear)

**Universal Replacement (Mallory Exact Duplicate Part No. UE1039)

†CONCENTRIKIT EQUIVALENT: K-2 KIT, BASE ELEMENTS AND SHAFTS: Bil-137, P1-226 (Panel) Bi8-132X, Ri-308 (Rear) 76-2 (Switch)

## RESISTORS

| ITEM No. | RATING OHMS | RATING WATT | REPLACEMENT DATA SPARTON PART No. | IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R27 | 15KΩ | ½ | | | |
| R28 | 47KΩ | ½ | | BTS-47K | |
| R29 | 100KΩ | ½ | | BTS-100K | |
| R30 | 150KΩ | ½ | | BTS-150K 5% | |
| R31 | 100KΩ | ½ | | | |
| R32 | 150Ω | ½ | | BTS-150 | |
| R33 | 220KΩ | ½ | | | |
| R34 | 10KΩ | ½ | | | |
| R35 | 10KΩ | ½ | | | |
| R36 | 15KΩ | ½ | | | |
| R37 | 1200Ω | ½ | | BTS-1200 | |
| R38 | 4.7Meg | ½ | | BTS-4.7Meg | |
| R39 | 100Ω | ½ | | BTS-100 | |
| R40 | 10KΩ | ½ | | | |
| R41 | 1000Ω | ½ | | BTS-1000 | |
| R42 | 33KΩ | ½ | | BTS-33K | |
| R43 | 56KΩ | ½ | | BTS-56K | |
| R44 | 150KΩ 5% | ½ | | BTS-150K 5% | |
| R45 | 47Ω | ½ | | BTS-47 | |
| R46 | 82Ω | ½ | | BTS-82 | |
| R47 | 100Ω | ½ | | BTS-100 | |
| R48 | 47000Ω 5% | ½ | | | |
| R49 | 1000Ω | ½ | | BTS-1000 | |
| R50 | 100Ω 5% | ½ | | BTS-100 5% | |
| R51 | 100Ω | ½ | | BTS-100 | |
| R52 | 3900Ω 5% | ½ | | | |
| R53 | 1000Ω | ½ | | BTS-1000 | |
| R54 | 100Ω 5% | ½ | | BTS-100 5% | |
| R55 | 100Ω | ½ | | BTS-100 | |
| R56 | 2700Ω | ½ | | BTS-2700 | |
| R57 | 120Ω 5% | ½ | | BTS-120 5% | |
| R58 | 100Ω | ½ | | BTS-100 | |
| R59 | 100Ω | ½ | | BTS-100 | |
| R60 | 3900Ω | ½ | | BTS-3900 | |
| R61 | 2200Ω 5% | ½ | | BTS-2200 5% | |
| R62 | 2700Ω 5% | ½ | | BTS-2700 5% | |
| R63 | 3900Ω 5% | ½ | | | |
| R64 | 8200Ω 5% | ½ | | | |
| R65 | 470KΩ | ½ | | | |
| R66 | 39Ω 5% | ½ | | BTS-39 5% | |
| R67 | 6800Ω 5% | ½ | | | |
| R68 | 1000Ω 5% | 2 | | BTB-1000 5% | |
| R69 | 1000Ω 5% | 2 | | BTB-1000 5% | |
| R70 | 1000Ω 5% | 2 | | BTB-1000 5% | |
| R71 | 1000Ω 5% | 2 | | BTB-1000 5% | |
| R72 | 5600Ω 5% | 2 | | BTB-5600 5% | |
| R73 | 6800Ω 5% | 2 | | BTB-6800 5% | |
| R74 | 5600Ω 5% | ½ | | | |
| R75 | 100KΩ 5% | ½ | | | |
| R76 | 2700Ω 5% | ½ | | BTS-2700 5% | |
| R77 | 330KΩ 5% | ½ | | BTS-330K 5% | |
| R78 | 5600Ω 5% | ½ | | BTS-5000 5% | |
| R79 | 22KΩ 5% | ½ | | BTS-22K 5% | |
| R80 | 330KΩ 5% | ½ | | | |
| R81 | 470KΩ | ½ | | | |
| R82 | 82Ω 5% | ½ | | BTS-82 5% | |
| R83 | 100Ω | ½ | | BTS-100 | |
| R84 | 47KΩ 5% | ½ | | BTS-47K 5% | |
| R85 | 100KΩ 5% | ½ | | BTS-100K 5% | |
| R86 | 100KΩ | ½ | | BTS-100K | |
| R87 | 82Ω 5% | ½ | | BTS-82 5% | |
| R88 | 1000Ω | ½ | | BTS-1000 | |
| R89 | 470KΩ | ½ | | BTS-470K | |
| R90 | 1000Ω | ½ | | BTS-1000 | |
| R91 | 150Ω 5% | ½ | | BTS-150 5% | |
| R92 | 47KΩ 5% | ½ | | BTS-47K 5% | |
| R93 | 4700Ω 5% | ½ | | BTS-4700 5% | |
| R94 | 4700Ω 5% | ½ | | BTS-4700 5% | |
| R95 | 10KΩ 5% | ½ | | BTS-10K 5% | |
| R96 | 6.8Meg | ½ | | BTS-6.8Meg | |
| R97 | 27KΩ 5% | ½ | | BTS-270K 5% | |
| R98 | 470KΩ | ½ | | BTS-470K | |
| R99 | 39Ω | 1 | | BTA-390 | |
| R100 | 5KΩ 5% | 2 | | BTB-5K 5% | |
| R101 | 270KΩ 5% | ½ | | BTS-270K 5% | |
| R102 | 3000Ω | 10 | | 1 ¾A-3000 | |
| R103 | 4700Ω 5% | ½ | | | |
| R104 | 3300Ω 5% | ½ | | BTS-3300 5% | |
| R105 | 150KΩ 5% | ½ | | | |
| R105 | 15KΩ 5% | ½ | | BTS-15K 5% | |
| R107 | 150KΩ 5% | ½ | | | |
| R108 | 1.2Meg 5% | ½ | | | |
| R109 | 27KΩ 5% | ½ | | | |
| R110 | 47KΩ 5% | ½ | | BTS-47K 5% | |

## RESISTORS (cont)

| ITEM No. | RATING OHMS | RATING WATT | REPLACEMENT DATA SPARTON PART No. | IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R111 | 4.7Meg 5% | ½ | | | |
| R112 | 1Meg 5% | ½ | | | |
| R113 | 15KΩ 5% | 1 | | | |
| R114 | 3.9Meg 5% | ½ | | | |
| R115 | 68000Ω 5% | ½ | | | |
| R116 | 22KΩ 5% | ½ | | | |
| R117 | 22KΩ 5% | ½ | | | |
| R118 | 22KΩ 5% | ½ | | | |
| R119 | 2200Ω 5% | ½ | | | |
| R120 | 1Meg 5% | ½ | | | |
| R121 | 1Meg 5% | ½ | | | |
| R122 | 1.1Meg 5% | ½ | | | |
| R123 | 4700Ω 5% | ½ | | BTS-4700 5% | |
| R124 | 18KΩ 5% | ½ | | | |
| R125 | 3.9Meg 5% | ½ | | | |
| R126 | 10000Ω 5% | ½ | | BTS-1000 5% | |
| R127 | 180KΩ 5% | ½ | | | |
| R128 | 5600Ω 5% | ½ | | BTS-560 5% | |
| R129 | 4700 5% | ½ | | | |
| R130 | 1Meg 5% | ½ | | | |
| R131 | 1000Ω | ½ | | | |
| R132 | 1000Ω | ½ | | | |
| R207 | 68000Ω 5% | ½ | | | |
| R208 | 15KΩ 5% | 2 | | | |
| R209 | 15KΩ 5% | 2 | | | |
| R210 | 220Ω 5% | ½ | | | |
| R211 | 39KΩ 5% | ½ | | | |
| R212 | 470 5% | ½ | | BTS-47 5% | |
| R213 | 2200Ω 5% | ½ | | BTS-2200 5% | |
| R214 | 100Ω | ½ | | BTS-100 | |
| R215 | 2700 5% | ½ | | BTS-270 5% | |
| R216 | 100Ω | ½ | | BTS-100 | |
| R217 | 5600Ω 5% | ½ | | | |
| R218 | 10KΩ 5% | ½ | | | |
| R219 | 47Ω 5% | ½ | | BTS-47 | |
| R220 | 2200Ω 5% | ½ | | BTS-2200 5% | |
| R221 | 100Ω | ½ | | BTS-100 | |
| R222 | 10KΩ 5% | ½ | | | |
| R223 | 10KΩ 5% | ½ | | | |
| R224 | 820KΩ 5% | ½ | | | |
| R225 | 3900Ω 5% | ½ | | | |
| R226 | 470KΩ | ½ | | | |
| R227 | 8200Ω 5% | ½ | | BTS-820 5% | |
| R228 | 10KΩ 5% | 2 | | | |
| R229 | 10KΩ 5% | 2 | | | |
| R230 | 27KΩ 5% | ½ | | | |
| R231 | 1Meg 5% | ½ | | | Note 1 |
| R232 | 1.5KΩ 5% | 2 | | | Note 1 |
| R233 | 15KΩ 5% | 2 | | | |
| R234 | 15KΩ 5% | 2 | | | |
| R235 | 33KΩ 5% | ½ | | | |
| R536 | 470KΩ | ½ | | | |
| R163 | 4700Ω 5% | ½ | | BTS-470 5% | |
| R164 | 2.2Ω | 1 | | | |
| R165 | 8.2Meg | 2 | | | |
| R166 | 2.2Ω | 1 | | | |
| R167 | 47Ω | 1 | | | |
| R168 | 2.2Ω | 1 | | | |
| R169 | 50Meg | 3 | | | |
| R170 | 50Meg | 3 | | | |
| R171 | 1.6Meg 5% | 2 | | | |
| R172 | 22Meg | 2 | | | |
| R173 | 100KΩ 5% | ½ | | | |
| R174 | 220KΩ 5% | ½ | | | |
| R175 | 3.3Meg 5% | ½ | | | |
| R176 | 1000Ω | | B | | |
| R177 | 2.7MegΩ 5% | | C | 5000Ω | 50 |
| R178 | 680KΩ 5% | | D | 3800Ω | |
| R179 | 560KΩ 5% | ½ | | | |
| R180 | 10KΩ 5% | ½ | | | |
| R181 | 15KΩ 5% | ½ | | | |
| R182 | 220KΩ 5% | ½ | | | |
| R183 | 10KΩ 5% | ½ | | | |
| R184 | 680Ω 5% | ½ | | BTS-680 5% | |
| R185 | 820 5% | ½ | | BTS-82 5% | |
| R186 | 82000Ω 5% | ½ | | | |
| R187 | 10KΩ 5% | 2 | | | |
| R188 | 10KΩ 5% | 2 | | | |
| R189 | 68000Ω 5% | ½ | | | |
| R190 | 10KΩ 5% | ½ | | | |
| R191 | 100KΩ 5% | ½ | | | |
| R192 | 4700 5% | ½ | | BTS-470 5% | |
| R193 | 5.6MΩ 5% | ½ | | | |
| R194 | 56KΩ 5% | ½ | | | |
| R195 | 100KΩ 5% | ½ | | | |
| R196 | 4700Ω 5% | ½ | | | |
| R197 | 56KΩ 5% | ½ | | | |
| R198 | 1200Ω 5% | ½ | | | |
| R199 | 120KΩ 5% | ½ | | | |
| R200 | 22KΩ 5% | ½ | | | |
| R201 | 100Ω | ½ | | BTS-100 | |
| R202 | 47KΩ 5% | ½ | | | |
| R203 | 220Ω 5% | ½ | | BTS-220 5% | |
| R204 | 39KΩ 5% | ½ | | | |
| R205 | 3900Ω 5% | ½ | | | |
| R206 | 470Ω 5% | ½ | | BTS-470 5% | |

Note L. Some versions use a single 56000 5 watt resistor in this application.

## TRANSFORMER (POWER)

| ITEM No | RATING PRI | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA SPARTON PART No | Halldorson PART No. | Merit PART No. | RCA TYPE No | Stancor PART No. | Thordarson PART No. | Triad PART No |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117VAC | 380VCT | 5VAC | | | | | | | |
| | ①1.4A | .083ADC | ③3A | | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3VAC ②7.8A | 6.3VAC ④9.4A | | | | | | | | |

## TRANSFORMER (POWER)

| ITEM No | RATING PRI | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA SPARTON PART No | Halldorson PART No. | Merit PART No | RCA TYPE No | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 | 117VAC | 748VCT | 10VAC | | | | | | | |
| | ②2.28A | .390ADC | ④6A | | | | | | | |

SPARTON MODEL 16A211 (Ch. CTV-2)

# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | SPARTON PART No. | Halldorson PART No. | Merit PART No. | RCA TYPE No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T3 | Vert. Osc. Trans. | 208T9 | B6701 | A-4003 | 208T9 | V402 | A-8122 | 26A04 | A-97Y |
| T4 | Horiz. Output Trans. | XD-2165-J | | | 240T1 | | | | |
| T5 | Vert. Output Trans. | XT-7898-A | Z1900 ① ② | A-3038 ① | 243T1 | V307 ① | A-8144 ① | 26S53 ① | A-99X ① |
| T6A B | Yoke(45°)Horiz. (11MH) Vert. (100MH | XD-2071-J | | | 223D1 | | | | |
| T7 | Horiz. Lin. Coil(.12-.82MH) ③ | | | | | | | | |
| T8 | Width Coil(16-75MH) | | | MWC-3 ① | 218R1 | | | WC-19 ① | |
| T9 | Purity Coil | XD-2233-C ④ | | | 224D1 ④ | | | | |
| T10 | Field Neutralizing Coil | | | | | | | | |
| T11 | Horiz. Dynamic Convergence Phase Coil(6-40MH) | | RF800 ⑤ ⑥ | MWC-1 ⑤ ⑦ | 216R1 | 201R3A | WC-5 ⑤ ⑦ | WC-13 ⑤ ⑧ | WC-11 ⑤ ⑦ |
| T12 | Horiz. Dynamic Convergence Output Trans. | XT-7648-F | | | 242T1 | | | | |
| T13 | Vert. Dynamic Convergence Output Trans. | 5XT-7610-C | | | 241T1 | | | | |

① Drill new mounting hole(s)
② Use 9 to 1 turns ratio.
③ Two coils, bifilar wound. Total inductance, coils connected series aiding-(.4-3.3MH).
④ Includes beam positioning magnets & neck shield assembly.
⑤ Enlarge mounting hole.
⑥ Connect to terms #1 & #2.
⑦ Connect to coded red & blue terms.
⑧ Connect to terms #3 & #4.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | SPARTON PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T14 | 6.4KΩ | 3.6Ω | AB44066-3 | Z1009 | A-3020 | A-3823 | 26S48 | S-9Z | |

## SPEAKER

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | SPARTON PART No. | QUAM PART No. | |
| SP1 | 10" | PM | 3.6Ω | PC63000-41 | 10A31 | |

## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | PRI. | SEC. | SPARTON PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | |
| L1 | Ant. Coils | 0Ω CT | 0Ω | | | | | |
| L2 | Fil. Choke | 0Ω | | | | | | |
| L3 | Neut. Coil | 0Ω | | | | | | |
| L4 | RF, Mixer Grid & Osc. Coils | 0Ω | | | | | | |
| L5 | Fil. Choke | 0Ω | | | | | | |
| L6 | RF Coil | 0Ω | | | | | | |
| L7 | 1st. Video IF | .9Ω | | | | | | |
| L8 | RF Choke | 1.2Ω | | | | | | |
| L9 | 21.75MC Trap | 0Ω | | | | | | |
| L10 | Fil. Choke | 0Ω | | | 19-1003 | BC-537 | 4608 | 3.8 Microhenries |
| L11 | 27.75MC Trap | 0Ω | | | 20-1006 | | | |
| L12 | 2nd. Video IF | .1Ω | | | 17-1003 †† | TV-102 | 6171A | |
| L13 | Fil. Choke | 0Ω | | | 19-1003 | BC-537 | 4608 | 3.8 Microhenries |
| L14 | 3rd. Video IF | .1Ω | | | 17-1003 †† | | 6171 | |
| L15 | Fil. Choke | 0Ω | | | 19-1003 | BC-537 | 4608 | 3.8 Microhenries |
| L16 | 4th. Video IF | .1Ω | | | 17-1004 †† | | 6171 | |
| L17 | RF Choke | 3Ω | | | 19-6022 | | 4626 | 25 Microhenries |
| L18 | Fil. Choke | 0Ω | | | 19-1003 | BC-537 | 4608 | 3.8 Microhenries |
| L19 | 21.75MC Trap | 0Ω | | | | | | |
| L20 | 5th. Video IF | .5Ω | | 6364-1 | 17-1001 ¶ | | | |
| L21 | RF Choke | 2.7Ω | | | 19-6022 | | 4626 | 25 Microhenries |
| L22 | Fil. Choke | 0Ω | | | 19-1003 | BC-537 | 4608 | 3.8 Microhenries |
| L23 | Series Peaking Coil | 7.7Ω | | | 19-3160 ■ | | 6120 ■ | 146 Microhenries, wound on 18KΩ resistor |
| L24 | Shunt Peaking Coil | 17Ω | | | 19-3660 | | 6146 | 600 Microhenries |
| L25 | Series Peaking Coil | 3Ω | | | 19-6022 | | 4626 | 25 Microhenries |
| L26 | Fil. Choke | 0Ω | | | 19-1003 | BC-537 | 4608 | 3.8 Microhenries |
| L27 | Series Peaking Coil | 4.4Ω | | | 19-7047 | | 6110 | 50 Microhenries |
| L28 | Series Peaking Coil | 7.3Ω | | | 19-3125 | | 6153 | 116 Microhenries |
| L29 | 3.58MC Trap | 1.8Ω | | | 17-6011 * ■ | | 1469 | |
| L30 | Series Peaking Coil | 8.7Ω | | | 19-3160 ▲ | TV-184 ▲ | 6120 ▲ | 156 Microhenries, wound on 8.2KΩ resistor |
| L31 | Shunt Peaking Coil | 11.5Ω | | | 19-3300 | | 6155 | 300 Microhenries |
| L32 | Sound Det. IF | .1Ω | | | | | 6171A | |
| L33 | 21.75MC Trap | 0Ω | | | | | 6171 * | |
| L34 | RF Choke | 2.7Ω | | | 19-6022 | | 4626 | 25 Microhenries |
| L35 | RF Coil | 2.2Ω | | | 19-1002 | | 4606 | 2.7 Microhenries, IRC part #CLA |
| L36 | 1st. Sound IF | 1.7Ω | | 6364-2 | 17-3495 ♦ | TV-113 ♦ | 1470A ♦ | |
| L37 | 2nd. Sound IF | 2Ω | 2.2Ω | 6667-5 | 17-1021 ▬ | TV-113 † | 6203 † | |
| L38 | Ratio Det. | 4.5Ω | 1.1ΩCT | 6684-4 | 17-3493 | TV-115 † | 6205 † | Tertiary winding -.8Ω |
| L39 | Horiz. Osc. | 20Ω | 50Ω | | 20-1402 # | TV-162 # | 6183 # | Waveform winding-46Ω |

# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (cont)

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: SPARTON PART No. | REPLACEMENT DATA: MEISSNER PART No. | REPLACEMENT DATA: MERIT PART No. | REPLACEMENT DATA: MILLER PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| L40 | Series Peaking Coil | 26Ω | | | | | 4652 | 1080 Microhenries |
| L41 | 4.5MC Trap | .7Ω | | | 20-1004 | TV-151 | 1469 | |
| L42 | Bandpass Grid Coil | 4.2Ω | | | 17-6011 | | 1470 | |
| L43 | Bandpass Plate Trans. | 8.5Ω | | | | | | Tapped @ 3.9Ω |
| L44 | Shunt Peaking Coil | 10.5Ω | | | 19-3250 | TV-185 | 6181 | 250 Microhenries |
| L45 | Burst Amp. Trans. | 4.1ΩCT | | | | | | |
| L46 | Phase Det. Coil | 7Ω | | | 19-3075 | | 6172 | 80 Microhenries |
| L47 | Series Peaking Coil | 2.9Ω | | | 19-6022 | | 4626 | 26 Microhenries |
| L48 | Shunt Peaking Coil | 26Ω | | | | | 4652 | 1080 Microhenries |
| L49 | Cathode Choke | 26Ω | | | | | 4652 | 1080 Microhenries |
| L50 | Chroma Reference Osc. Coil | .4Ω | | | | | | |
| L51 | Shunt Peaking Coil | 26Ω | | | | | 4652 | 1080 Microhenries |
| L52 | Shunt Peaking Coil | 4.4Ω | | | | | 6110 | 50 Microhenries |
| L53 | Quadrature Trans. | | | | | | | R-Y winding -1.7Ω<br>B-Y winding -1.1Ω |
| L54 | B-Y Synchronous Detector Plate Coil | 28Ω | | | | | | |
| L55 | R-Y Synchronous Detector Plate Coil | 28Ω | | | | | | |
| L56 | G-Y Plate Series Peaking Coil | 17Ω | | | | | 4412 | 585 Microhenries |
| L57 | Shunt Peaking Coil | 7.5Ω | | | 19-1921 | | 4512 | 118 Microhenries |
| L58 | R-Y Plate Series Peaking Coil | 14Ω | | | | | 4412 | 627 Microhenries |
| L59 | Shunt Peaking Coil | 6Ω | | | 19-1920 | | 4409 | 81 Microhenries |
| L60 | B-Y Plate Series Peaking Coil | 18Ω | | | | | | 685 Microhenries |
| L61 | Shunt Peaking Coil | 8.5Ω | | | | | | 139 Microhenries |

■ Parallel with 18KΩ resistor.
▲ Parallel with 8.2KΩ resistor.
♦ Use one winding only and use adaptor plate.
◓ Drill new mounting holes.
† Use adaptor plate.
# Reverse coil mounting in can.
* Disconnect 100MMF capacitor.
†† Drill new mounting hole.
¶ Detune trap - Retune IF.
*■ Drill new mounting hole - Parallel with 120MMF capacitor.

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## FILTER CHOKE

| ITEM No. | RATINGS: TOTAL DIRECT CURRENT | RATINGS: D. C. RESISTANCE | RATINGS: INDUCTANCE (0 CURRENT 1000 ~) | REPLACEMENT DATA: SPARTON PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|
| L62 | .390ADC | 35Ω | 3.8HY | | | | | | |
| L63 | .083ADC | 114Ω | 3.8HY | AB-470009-1 | C5040 | | C-2303 ① | 26C82 | C-15X ① |

① Drill one new mounting hole.

## FUSES

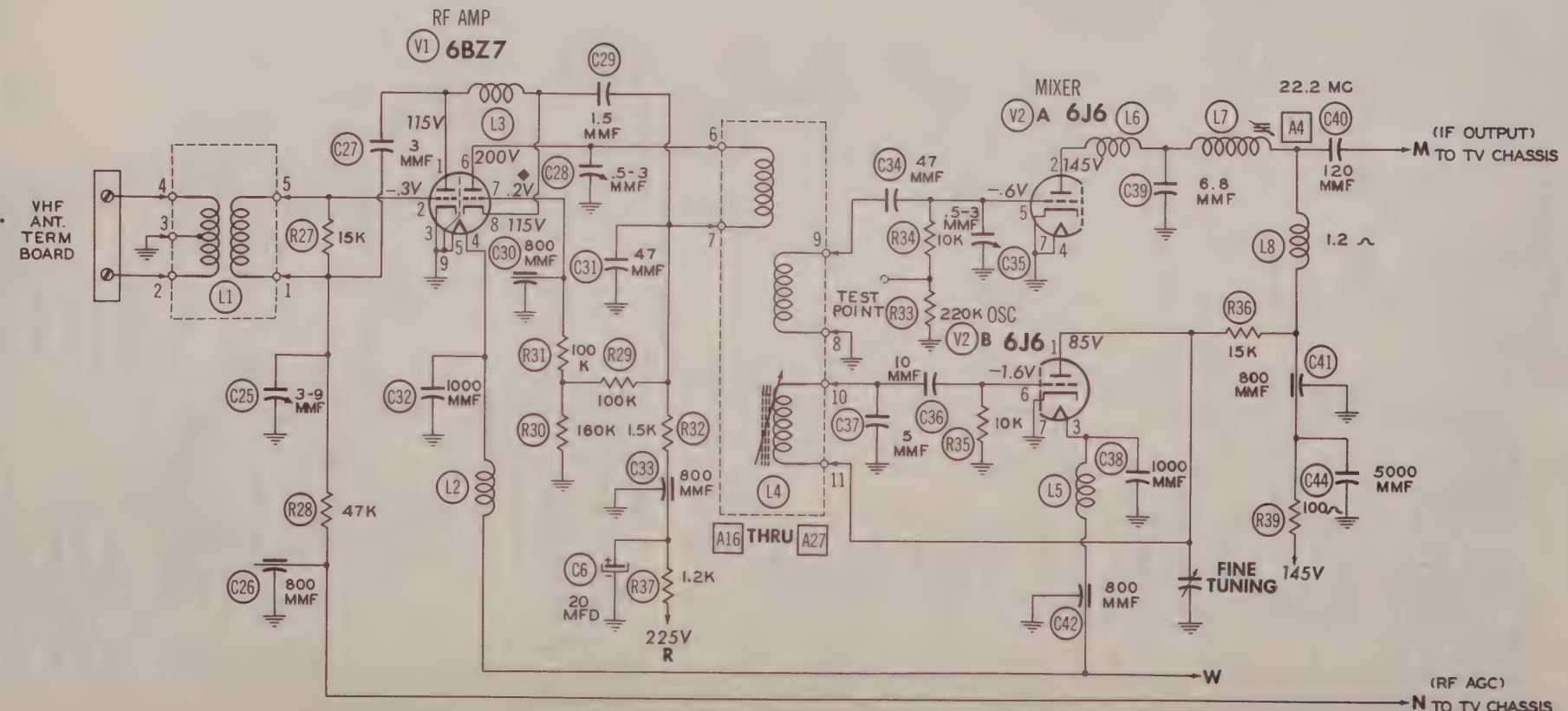
| ITEM No. | TYPE | RATING | REPLACEMENT DATA: SPARTON PART No. FUSE | SPARTON PART No. HOLDER | LITTELFUSE PART No. FUSE | LITTELFUSE PART No. HOLDER | BUSS PART No. FUSE | BUSS PART No. HOLDER |
|---|---|---|---|---|---|---|---|---|
| M1 | 3AG | 5A 250V | | | 312005(3AG 5A) | 341001 | AGC5 | HKP |
| M2 | 3AG P/T | ½A 250V | | | 318. 500(3AG P/T ½A) | | GJV½ | |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA: SPARTON PART No. | REPLACEMENT DATA: SYLVANIA PART No. | NOTES |
|---|---|---|---|---|
| M3 | 1N60 | | 1N60 or 1N132 | Sound Detector |
| M4 | 1N60 | | 1N60 or 1N132 | Scan protection |

## MISCELLANEOUS

| ITEM No. | PART NAME | SPARTON PART No. | NOTES |
|---|---|---|---|
| M5 | Dial Light | | #47 |
| M6 | Tuner | 93174 | |
| M7 | Relay | | Scan protection |
| M8 | Delay Line | | Luminance channel |
| M9 | Beam positioning Magnet | | Blue beam |
| M10 | Beam positioning Magnet | | Red beam |
| M11 | Beam positioning Magnet | | Green beam |
| M12 | Neck Shield | | |
| B3 | Trimmer Cap. | 60-341 | Horiz. locking range (4-70MMF) |
| | Trimmer Cap. | | Color Phase (20-75MMF) |




TUNER SCHEMATIC

# DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL - RF-IF CHASSIS

1. Remove 11 push-on type control knobs from front panel of cabinet.
2. Remove 16 wood screws. Remove rear cover.
3. Disconnect picture tube socket, HV leads (2), yoke plug, signal plug, power plug, speaker plug and 2 ground straps.
4. Remove 2 wood screws holding antenna terminal bracket.
5. Remove 4 chassis bolts. Remove RF-IF chassis.

CHASSIS REMOVAL - SWEEP CHASSIS

1. Disconnect signal and power plugs from RF-IF chassis, HV leads (2) and picture tube socket.
2. Remove 4 chassis bolts. Remove sweep chassis.

SPEAKER REMOVAL

1. Remove 4 speaker nuts. Remove speaker.

LIF
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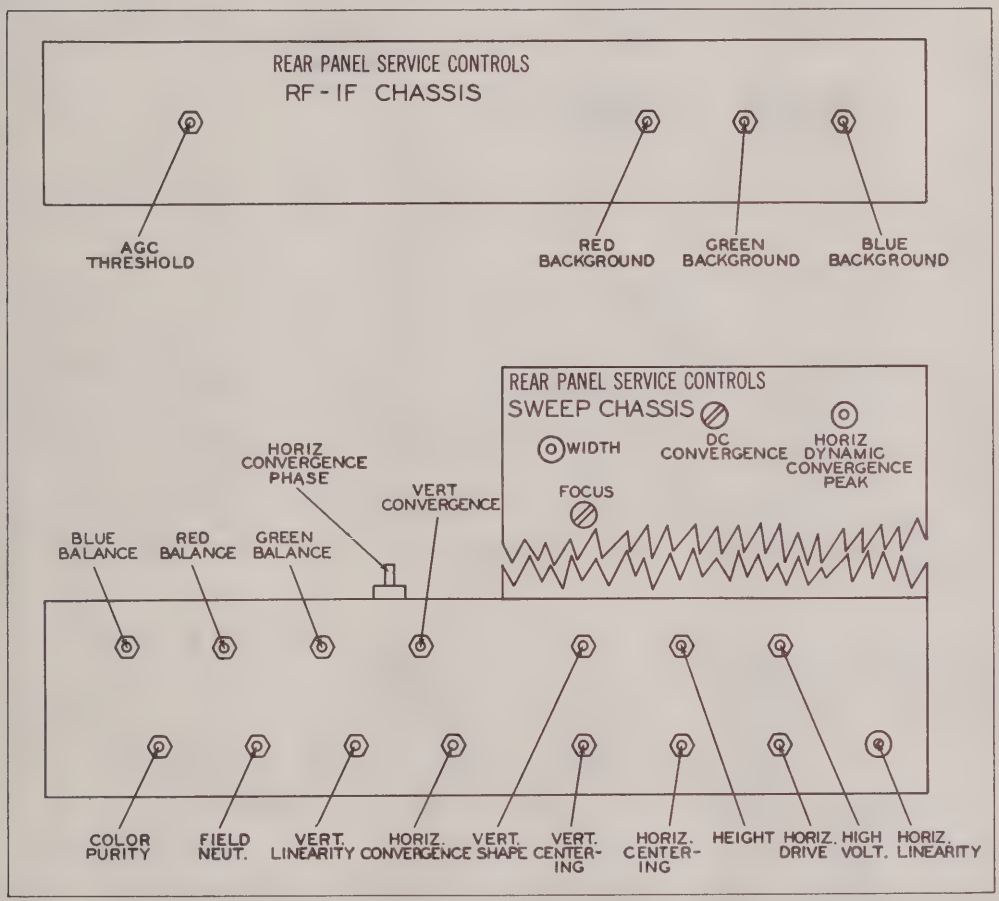
ST
COLORADO

# SERVICE ADJUSTMENT LOCATION



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DENVER, COLORADO

WEBSTER ELECTRIC
MODEL 96-10

WEBSTER ELECTRIC
MODEL 96-10

| | |
|---|---|
| TRADE NAME | Webster Electric Model 96-10 |
| MANUFACTURER | Webster Electric Co., Racine, Wis. |
| TYPE SET | AC Operated Audio Amplifier |
| TUBES (Six) | Types 6J5 Preamp., 6SJ7 AF Amp., 6J5 Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier |
| POWER SUPPLY | 110-120 Volts AC |
| RATING | .74 Amp. @ 117 Volts AC |

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# PARTS LIST AND DESCRIPTIONS

WEBSTER ELECTRIC
Model 96-10

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No. | USE | REPLACEMENT DATA: Webster Electric PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | Preamp. | 6J5 | 6J5 | 6Q | |
| V2 | AF Amp. | 6SJ7 | 6SJ7 | 8N | |
| V3 | Phase Inv. | 6J5 | 6J5 | 6Q | |
| V4 | Audio Output | 6V6GT | 6V6GT | 7S | |
| V5 | Audio Output | 6V6GT | 6V6GT | 7S | |
| V6 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING: CAP. | RATING: VOLT. | REPLACEMENT DATA: Webster Electric PART No. | MALLORY PART No. | PYRAMID PART No. | SANGAMO PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C1A | ●40 | 450 | 241-14238 | FP369.1 | TM-3084 | T-685 | |
| B | ■40 | 450 | | | | | |
| C | ▲40 | 25 | | | | | |
| C2A | ▲40 | 450 | 241-14236 | FP238 | TM-D40-450 | D-235 | |
| B | ●40 | 450 | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT. | REPLACEMENT DATA: Webster Electric PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| C3 | .047 | 400 | 211-15048 | DF-503 | | PT4147 | |
| C4 | .2 | 400 | 211-14492 | | | PT402 | |
| C5 | .1 | 400 | S3595 | DF-104 | | PT401 | |
| C6 | .1 | 400 | S3595 | DF-104 | | PT401 | |
| C7 | 200 | | | D6-201 | GP2K-201 | UC-532 | |

## CONTROLS

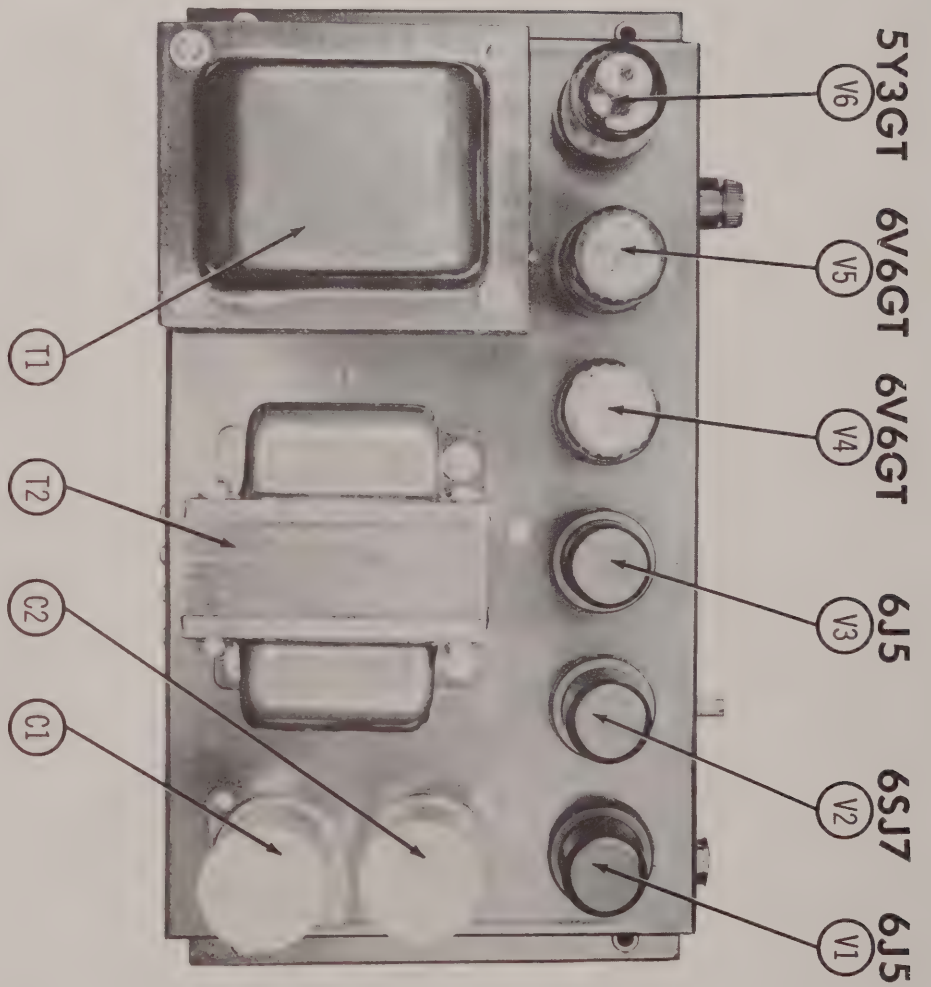
| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: Webster Electric PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500KΩ | ½ | S3911 | Q13-133 | A47-500K-Z | AB-60 | U-48 | Volume |
| B | Shaft | | Not Req. | RQ | FKS-1/4 | AK-1 | Not Req. | Attach to R1A. |

## RESISTORS

| ITEM No. | RATING: OHMS | RATING: WATT | REPLACEMENT DATA: Webster Electric PART No. | REPLACEMENT DATA: IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R2 | 3000Ω 5% | ½ | 29501-17 | BTS-3000 5% | |
| R3 | 51KΩ 5% | ½ | 29501-35 | BTS-51K 5% | |
| R4 | 5100Ω 5% | ½ | 29501-21 | BTS-5100 5% | |
| R5 | 510KΩ 5% | ½ | 29501-53 | BTS-510K 5% | |
| R6 | 1000Ω | ½ | 29501-11 | BTS-1000 | |
| R7 | 360KΩ 5% | ½ | 29501-50 | BTS-360K 5% | |
| R8 | 100KΩ 5% | ½ | 29501-40 | BTS-100K 5% | |
| R9 | 36KΩ 5% | ½ | 29501-33 | BTS-36K 5% | |

| ITEM No. | RATING: OHMS | RATING: WATT | REPLACEMENT DATA: Webster Electric PART No. | REPLACEMENT DATA: IRC PART No. | NOTES |
|---|---|---|---|---|---|
| R10 | 36KΩ 5% | ½ | 29501-33 | BTS-36K 5% | |
| R11 | 10KΩ 5% | ½ | 2950-104 | BTS-10K 5% | |
| R12 | 240KΩ 5% | ½ | 29501-48 | BTS-240K 5% | |
| R13 | 250Ω | 5 | 29502-19 | 1 3/4A-250 | |
| R14 | 240KΩ 5% | ½ | 29501-48 | BTS-240K 5% | |
| R15 | 3900Ω | ½ | 29501-20 | BTS-3900 | |
| R16 | 1000Ω | 5 | 29502-15 | 1 3/4A-1000 | |
| R17 | 10KΩ | 20 | 212-20221 | 20-10K | |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | Webster Electric PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 117VAC @ .74A | 640VCT 120ADC | 5VAC @ 2A | 6.3VCT @ 1.8A | 212-19895 | P9313 | | PM-8422① | 22R06 ② | R-14B |

① Mount in original cut out, use corner washers if necessary.
② Drill new mounting holes.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | Webster Electric PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 6.7KΩ | 16Ω Tap @ 8Ω @ 4Ω | 211-19411 | H4103 ① | A-3130 ① ② | | 22S44 | S-31A ① | ① Drill new mounting holes. ② Tape extra sec. leads. |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Webster Electric PART No. | | LITTELFUSE PART No. | | BUSS PART No. | | | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER | | |
| M1 | 3AG | 2A 250V | P8755-7 | S4619 | 312002. (3AG2A) | 342001 | AGC2 | HKP | | |




## CHASSIS—BOTTOM VIEW

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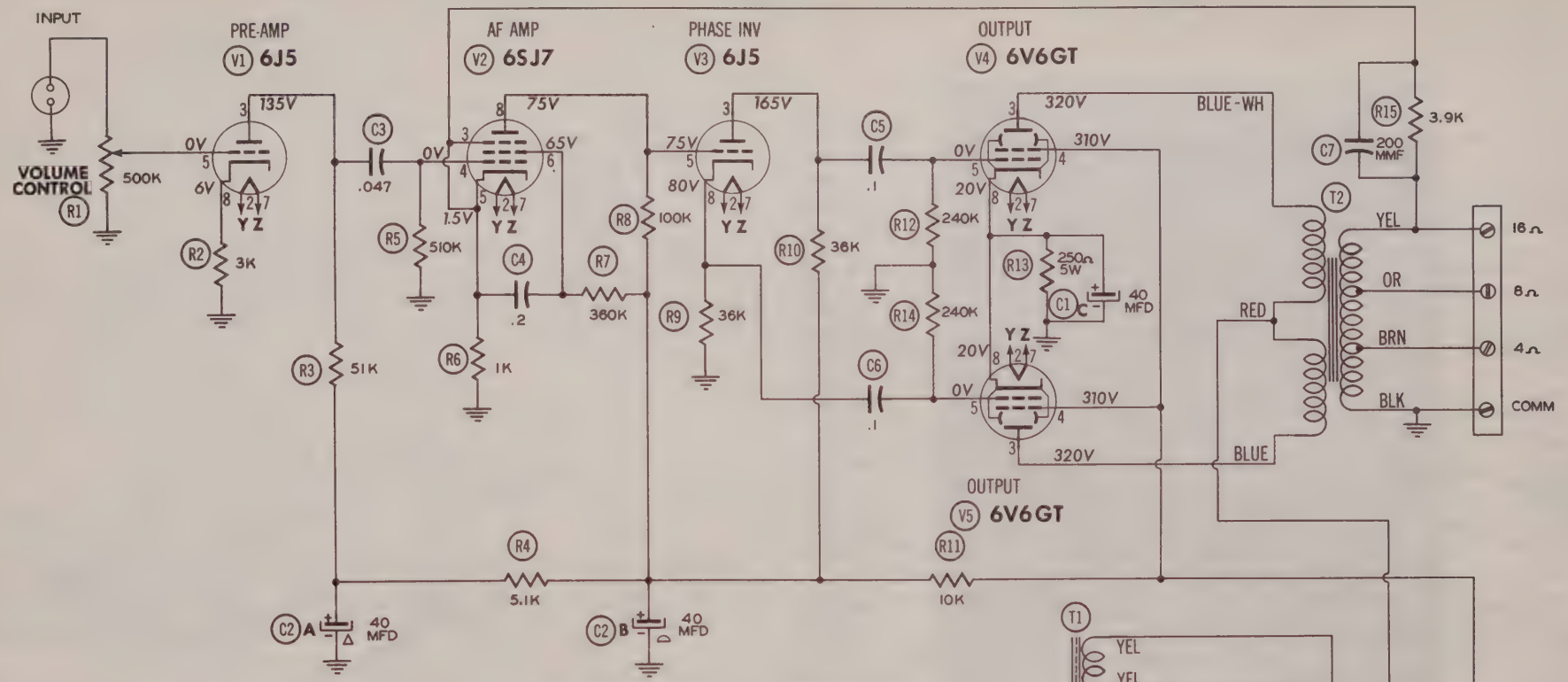
3924 MEADE ST.
DENVER, COLORADO

WEBSTER ELECTRIC
Model 96-10




THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6J5 | TP | .1Ω | †67KΩ | NC | 12Ω | NC | .1Ω | 3KΩ |
| V 2 | 6SJ7 | TP | .1Ω | 800Ω | 510KΩ | 800Ω | †371KΩ | .1Ω | †100KΩ |
| V 3 | 6J5 | TP | .1Ω | †47KΩ | NC | †100KΩ | TP | .1Ω | 36KΩ |
| V 4 | 6V6GT | TP | .1Ω | †150Ω | †1KΩ | 240KΩ | NC | .1Ω | 250Ω |
| V 5 | 6V6GT | TP | .1Ω | †150Ω | †1KΩ | 240KΩ | NO | .1Ω | 250Ω |
| V 6 | 5Y3GT | NC | 10KΩ | NC | 120Ω | NC | 120Ω | NC | 10KΩ |

†MEASURED FROM PIN 2 OF V5.
TP-TIE POINT.
NC-NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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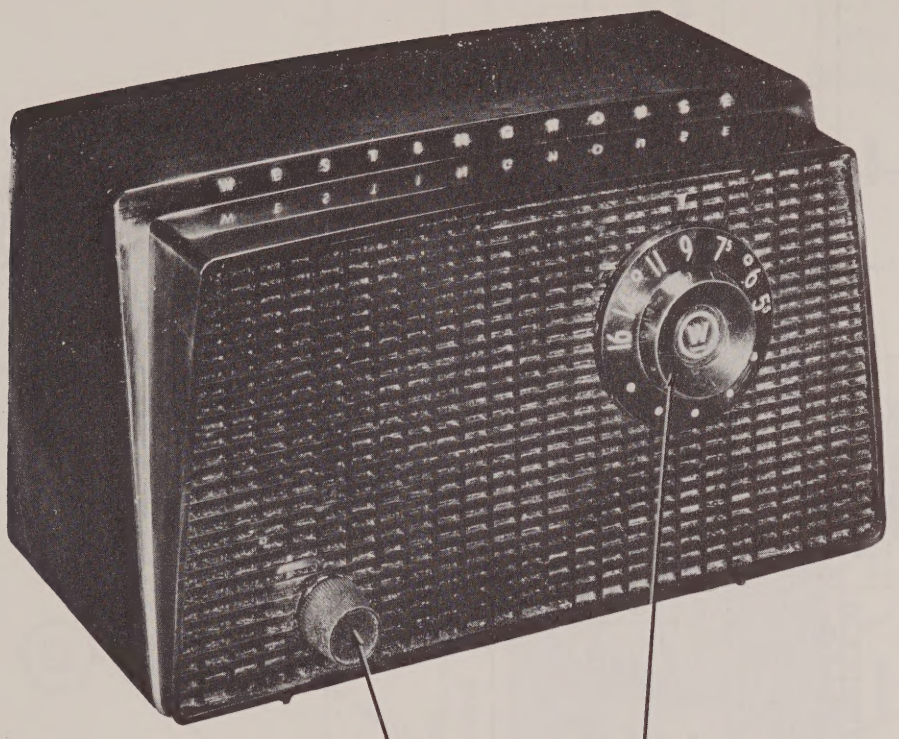
WESTINGHOUSE MODELS H-499T5A, H-500T5A (Ch. V-2238-1)




PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

WESTINGHOUSE MODELS H-499T5A, H-500T5A (Ch. V-2238-1)

| | |
|---|---|
| TRADE NAME | Westinghouse Models H-499T5A, H-500T5A, (Ch. V-2238-1) |
| MANUFACTURER | Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J. |
| TYPE SET | AC-DC Operated AM Superheterodyne Receiver |
| TUBES (Five) | Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier |
| POWER SUPPLY | 105-120 Volts AC-DC |
| RATING | .25 Amp. @ 117 Volts AC |
| TUNING RANGE—BROADCAST | 540KC-1600KC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | 200MMF | High side to ant. stator lug. Low side to B-. | 455KC (400~ Mod.) | Tuning Gang Fully Open | Across Voice Coil | A1, A2, A3, A4 | Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation. |
| 2. | " | " | 1625KC | " | " | A5 | |
| 3. | | Loop | 1400KC | Tune to 1400 signal | " | A6 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |

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# PARTS LIST AND DESCRIPTIONS

WESTINGHOUSE
Model H-499T5A

# PARTS LIST AND DESCRIPTIONS (Continued)

## TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

| ITEM No. | USE | REPLACEMENT DATA | | RETMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| | | Westinghouse PART No. | STANDARD REPLACEMENT | | |
| V1 | Converter | 12BE6 | 12BE6 | 7CH | |
| V2 | IF Amp. | 12BA6 | 12BA6 | 7BK | |
| V3 | Det. -AVC-AF Amp | 12AV6 | 12AV6 | 7BT | |
| V4 | Audio Output | 50C5 | 50C5 | 7CV | |
| V5 | Rect. | 35W4 | 35W4 | 5BQ | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | Westinghouse PART No. | MALLORY PART No. | PYRAMID PART No. | SANGAMO PART No. | |
| C1A | 50 | ▲150 | V-15538-1 | FP214 | TM-D50-150 | D-070 | |
| B | 50 | ■150 | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | Westinghouse PART No. | CENTRALAB PART No. | ERIE PART No. | MALLORY PART No. | |
| C2 | 10000 | | V-9863-3 | DD-103 | 811-01 | DC511 | |
| C3A | 220 | | ♦V-15542-1 | | | | |
| B | 5000 | | | | | | |
| C | 5000 | | | | | | |
| D } | 250 | | | | | | |
| E } | | | | | | | |
| C4 | 10000 | | V-9863-3 | DD-103 | 811-01 | DC511 | |
| C5 | .047 | 400 | V-10157-4473M | DF-503 | | PT4147 | |

♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B, and R5C are combined in one unit. When replacing items separately, C3D and C3E should total 250MMF.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Westinghouse PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | |
| R1A | 500K | ½ | V-15541-1 | Q13-133 | A47-500K-Z | | U-48 | Volume |
| B | Shaft | | Not Req. | Not Req. | KSS-3 | | Not Req. | Attach to R1A. |
| C | Switch | | Not Req. | 76-1 | SWE-12 | | US-26 | Attach to R1A. |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|
| | OHMS | WATT | Westinghouse PART No. | IRC PART No. | |
| R2 | 22KΩ | ½ | RC20AE223M | BTS-22K | |
| R3 | 3.3Meg | ½ | RC20AE335M | BTS-3.3Meg | |
| R4 | 180Ω | ½ | RC20AE181K | BTS-180 | |
| R5A | 6.8Meg | ½ | ♦V-15542-1 | BTS-6.8Meg | |
| B | 470KΩ | ½ | | BTS-470K | |
| C | 470KΩ | ½ | | BTS-470K | |

| ITEM No. | RATING | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|
| | OHMS | WATT | Westinghouse PART No. | IRC PART No. | |
| R6 | 150Ω | ½ | RC20AE151K | BTS-150 | |
| R7 | 1000Ω | 1 | RC30AE102M | BTA-1000 | |

♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B, R5C are combined in one unit.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | Westinghouse PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2.4KΩ | 3.3Ω | Part of speaker | Z1101 | A-3025 | A-3332 | S-12X | 26S56 ① | ① Drill one new mounting hole. |

## SPEAKER

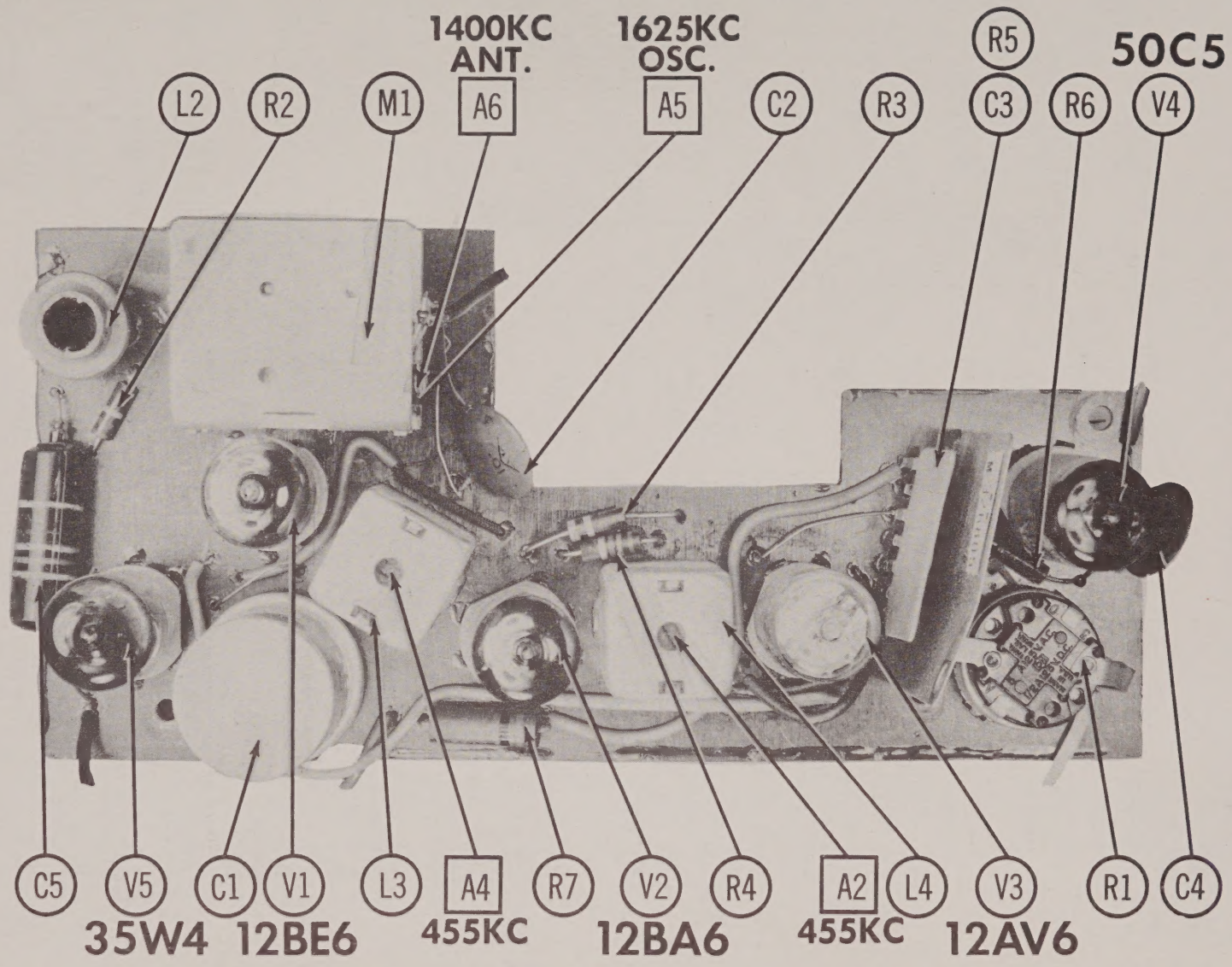
| ITEM No. | RATINGS | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | Westinghouse PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3.3Ω | V-15557-1 | 4A07 | |

## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | PRI. | SEC. | Westinghouse PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | |
| L1 | Loop Ant. | 3.6Ω | | V-1558-1 | | | | Includes Cabinet Back. |
| L2 | Osc. Coil | 1Ω | 12Ω | V-15540-1 | | | | |
| L3 | Input IF | 17Ω | 17Ω | V-15547-1 | 16-6780 | BC-352 | 13-PC1 | |
| L4 | Output IF | 17Ω | 17Ω | V-15547-1 | 16-6780 | BC-353 | 13-PC2 | |

## MISCELLANEOUS

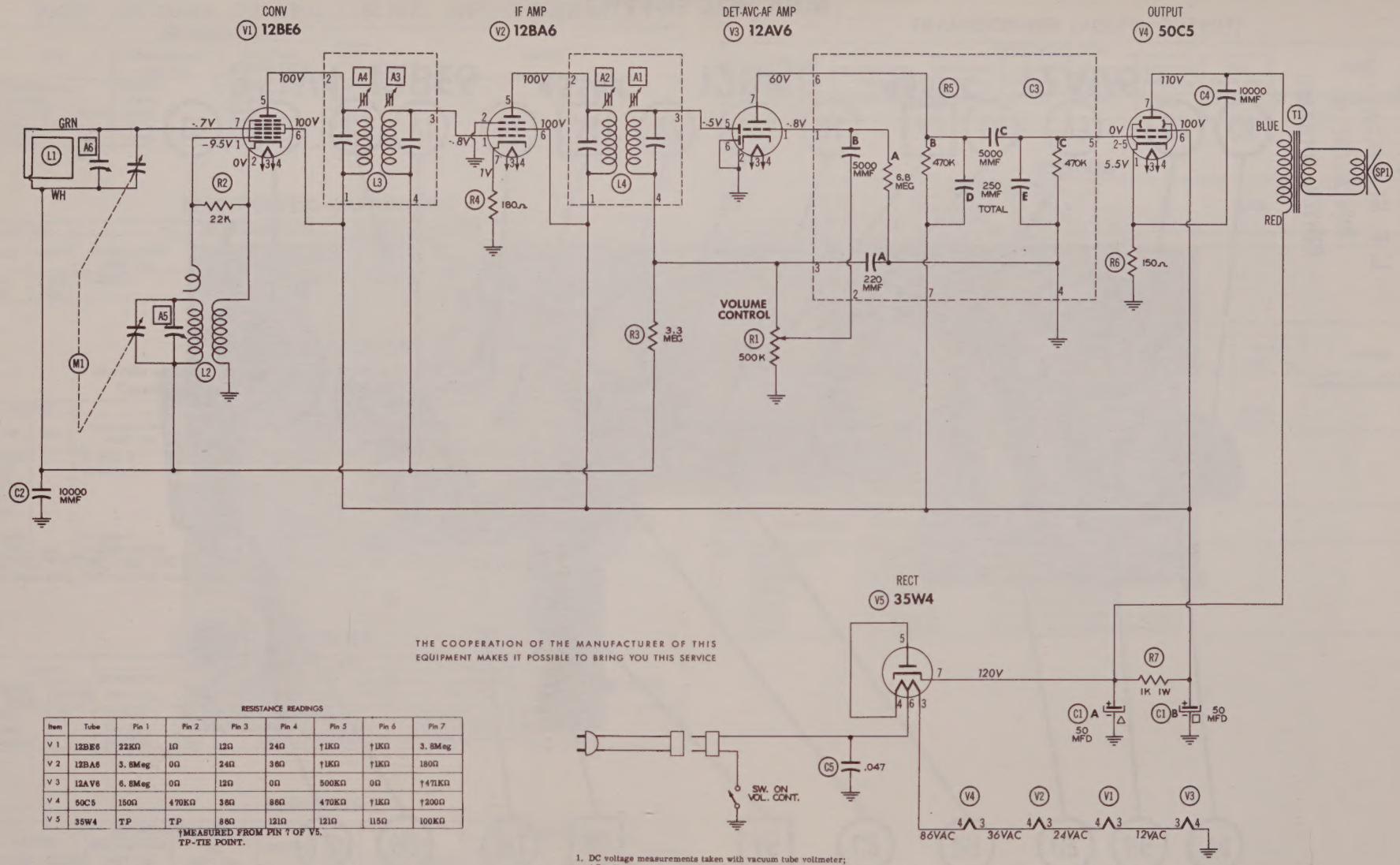
| ITEM No. | PART NAME | Westinghouse PART No. | NOTES |
|---|---|---|---|
| M1 | Tuning Cap. | V-15539-1 | 2 Gang (14-320MMF; 15-105MMF) |
| | Cabinet | V-1400-10 | Model H-499T5A |
| | Cabinet | V-1400-T | Model H-500T5A |
| | Knob | V-15549-5 | Dial-Model H-499T5A |
| | Knob | V-15549-1 | Dial-Model H-500T5A |
| | Knob | V-14483-13 | On-Off-Volume-Model H-499T5A |
| | Knob | V-14483-14 | On-Off-Volume-Model H-500T5A |




CHASSIS TOP VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

WESTINGHOUSE
Model H-499T5A




THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V 1 | 12BE6 | 22KΩ | 1Ω | 12Ω | 24Ω | †1KΩ | †1KΩ | 3. 8Meg |
| V 2 | 12BA6 | 3. 8Meg | 0Ω | 24Ω | 36Ω | †1KΩ | †1KΩ | 180Ω |
| V 3 | 12AV6 | 6. 8Meg | 0Ω | 12Ω | 0Ω | 500KΩ | 0Ω | †471KΩ |
| V 4 | 50C5 | 150Ω | 470KΩ | 36Ω | 86Ω | 470KΩ | †1KΩ | †200Ω |
| V 5 | 35W4 | TP | TP | 86Ω | 121Ω | 121Ω | 115Ω | 100KΩ |

†MEASURED FROM PIN 7 OF V5.
TP-TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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